Project ID:	Somerville	South Am	endmer	nt 2	Stı	ream	Class	:	Pere	nnial		
Stream ID:	#9B(44)				Lo	catio	n:		Mack	ey, IN		
Lat:	38.23695	Long:	-8	7.35536	Riv	ver Ba	asin:		Ohio			
Investigators:	Raj, Josh	-	-		•			=				
Signature:			[	Date:		5-May	/-2011		Reas	on for Survey:		
Signature.			7	Γime:			3:3	9 PM	404 F	unctional Asse	ssment	
WEATHER		Current			Past 2	24-Ho	urs			Heavy rain in la	ast 7-day	'S
CONDITIONS		Storm (He	avy Rain)		Sto	rm (Hea	avy Rair	1)		□ NO □ \	es′es	
		Rain Stead	dy		☐ Raiı	n Stead	у			Air Temp °C	,	18
		Showers (	Intermitte	nt)	Sho	wers (I	ntermit	tent)		Air Temp °F	(	65
		Cloud Cov	er %		☑ Clo	ud Cove	er %		90	Other:		
		☑ Clear/Sun	ny		Clea	ar/Sunn	ıy					
OITE I COATIO	NI/84 A D	0 . 144										
SITE LOCATION	)N/MAP	See Attac	nment									
STREAM		Stream Su	bsysten	n					Strea	ım Type		
CHARACTERI	ZATION	✓ Perennial	_	ermittent	√ Eı	phemer	al			ldwater		
									_ ✓ w	armwater		
		Stream Or	gin							Catchmei	nt Area	
		Upland Ru	_	<b>7</b>	Mixture	of Oria	ins			Mile <sup>2</sup>	0	.76
		Spring-fed		_	Wetland		Other			Km²	2	2.0
							011101					
WATERSHED		Surroundi	ng Land	l use & P	ercen	tage		Local	l Wate	ershed NPS Pol		
FEATURES		Forest			mmercia	al			eviden			
		Field/Past		Oth	ner					ources Ag. indu	ced sedi	ment
		✓ Agriculture	e 10	00%			_	Local	l Wate	ershed Erosion		
		Residentia	ıl					☐ Nor	ne 🔽	Moderate He	eavy	
RIPARIAN		Indicate th	e domir	nant type	and r	edoro	d the c	domin	ant si	pecies present		
VEGETATION		Trees 🗸		Grasse		Herbs		None		process		
(18 meter buff	er)	Dominant			b line,			110110				
,	,				,							
INSTREAM		Est. Reach	-		ft	1319	m	402		Canopy Cover		
FEATURES		Est. Stream			ft		m	0.0		✓ Open	Partly Ope	n
		Sampling F			ft <sup>2</sup>	0	m <sup>2</sup>	0		Shaded	Partly Sha	dedC
		Sampling A		) <sup>2</sup>	mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0				
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water Mark	ft	0.00
		Est. Water	Depth		in	3.0	m	0.1		High Water Mark	m	0.00
		Surface Ve	locity		ft/s	24.0	m/s	7.3		% of Stream Morp	phology	
									Rif	fle %	Run %	
		Channelize	ed ☑ ye	s 🗌 No	)				Po	ol %	Glide Pool	
		Dam Prese	ent 🗌 <sub>Ye</sub>	s 🗹 No	)				Ste	p Pool Series		
LARGE WOOD	<b>v</b>	LWD 0	.0 m	2	0	ft <sup>2</sup>						
DEBRIS												
		Density of	LWD	m²/kı	m²	0.00	00000	000		ft <sup>2</sup> /mile <sup>2</sup>	0.000000	0000
1		<sub>1</sub> =, O.		,						<i>-</i>		<del>-</del>

VEGETA			Rooted Emerge Free Floating		nergent ae		iinant species pre ] Rooted Floating ] Floating Algae esent	sent ✓ None	e <b>0</b> %	
WATER (	QUALITY		Temperature Conductivity Total Dissolved pH 8.0 Turbidity	_	<b>668</b> mg/l	] ☑ N □ c Wat	hemical An	wage aerobic	Petroleum	
				Slight Turbid		_	Slick Sheen Other	_ Globs	Flecks	
SEDIMEN SUBSTR			Odors  Normal Chemical Other	Anaerobic N	etroleum Ione		Relic Shells Looking at stone embedded, are u	Other s whicl ındersi	des black in color	
IN	NORGANIC	SUB	Absent :	Slight Moderate	: <u> </u>	Profuse	GANIC SUBSTRA			
Substrate				te inSampling	Subst		Characteris		% Composition	n in
Туре			=	each	Ту	ре			Sampling Read	ch
Bedrock					Detr	itus	Sticks, wood, co	oarse		
Boulder	>10"						plant materi	al		
Cobble	2.5 - 10	0"		5	Mu		Black very fi	ne		
Cobble Gravel	2.5 - 10 0.1 - 2.	0" 5"		50	Мι	nd	Black very fi organic matt	ne :er		
Cobble Gravel Sand	2.5 - 10 0.1 - 2. gritty	0" 5"		50 30	-	nd	Black very fi organic matt Grey, shel	ne :er I		
Cobble Gravel Sand Silt	2.5 - 10 0.1 - 2. gritty gooey	0" 5" /		50	Мι	nd	Black very fi organic matt	ne :er I		
Cobble Gravel Sand Silt Clay	2.5 - 10 0.1 - 2. gritty gooey slick	0" 5" /		50 30 15	Mu Ma	ud arl	Black very fi organic matt Grey, shel fragments	ne er I		
Cobble Gravel Sand Silt Clay	2.5 - 10 0.1 - 2. gritty gooey slick	0" 5" /		50 30 15 HABITAT ASSESS	Mu Ma	ud arl	Black very fi organic matt Grey, shel fragments	ne er I		
Cobble Gravel Sand Silt Clay  Hak Parai	2.5 - 10 0.1 - 2. gritty gooey slick bitat meter	0" 5" /	Optimal	50 30 15  HABITAT ASSESS SubOptima	Mu Ma	arl - LO	Black very fi organic matt Grey, shel fragments W GRADINET ST	ne er I	Poor	
Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter nal	0" 5" /	Optimal or than 50%	50 30 15 HABITAT ASSESS SubOptime 30-50% for low	Mu Ma SMENT	ud arl LO	Black very fi organic matt Grey, shel fragments W GRADINET ST Marginal	rer I	<b>Poor</b>	
Cobble Gravel Sand Silt Clay  Hat Parai 1. Epifaur Substrate	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	0" 5" / Greate	Optimal or than 50% gradient streams)	50 30 15  HABITAT ASSESS SubOptime 30-50% for low gradient streams) mi	Mu Ma	- LOV	Black very fi organic matt Grey, shel fragments W GRADINET ST Marginal	rer I I I I 10% for low gra	Poor r dient streams)	
Cobble Gravel Sand Silt Clay Hat Parai 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	O"  5"  /  Greate for low of subs	Optimal or than 50% gradient streams) strate favorable for	50 30 15 HABITAT ASSESS SubOptime 30-50% for low gradient streams) mi stable habitat; well-s	Mu Ma	- LOT 10-30% gradier stable	Black very fi organic matt Grey, shel fragments W GRADINET ST Marginal % for low nt streams) mix of habitat; habitat	REAN 10% for low gra	Poor r dient streams) nabitat; lack of	
Cobble Gravel Sand Silt Clay  Hat Parai 1. Epifaur Substrate	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	O"  5"  /  Greate for low of subsepifaur	Optimal or than 50% gradient streams) strate favorable for hal colonization &	50 30 15  HABITAT ASSESS SubOptime 30-50% for low gradient streams) mi stable habitat; well-s for full colonization	Mu Ma	T - LO	Black very finorganic matter organic matter organic matter of the fragments of the fragments of the fragment o	TREAM  10% for low grastable habitat	Poor r dient streams) nabitat; lack of is obvious;	
Cobble Gravel Sand Silt Clay Hat Parai 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	O"  5"  Greate for low of subsepifaur fish co	Optimal or than 50% gradient streams) strate favorable for hal colonization & ever; mix of snags,	50 30 15  HABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h	Mu Ma	10-30% gradiel stable available desirat	Black very finorganic matter organic	TREAN  10% for low grastable habitat substra	Poor r dient streams) nabitat; lack of is obvious; te unstable or	
Cobble Gravel Sand Silt Clay Hat Parai 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	Greate for low of subsepifaur fish co subme	Optimal or than 50% gradient streams) strate favorable for hal colonization &	50 30 15  HABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h	Mu Ma	10-30% gradiel stable available desirat	Black very finorganic matter organic matter organic matter of the properties of the	TREAM  10% for low grastable habitat	Poor r dient streams) nabitat; lack of is obvious; te unstable or	
Cobble Gravel Sand Silt Clay Hat Parai 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	Greate for low of subsepifaul fish co subme banks,	Optimal or than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut	30 15  HABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of	Mu Ma	10-30% gradiel stable available desirate frequent	Black very finorganic matter organic matter organic matter of the properties of the	TREAN  10% for low grastable habitat substra	Poor r dient streams) nabitat; lack of is obvious; te unstable or	
Cobble Gravel Sand Silt Clay Hat Parai 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	Greater for low of subsepifaur fish consubanks, stable	Optimal or than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other	30 15  HABITAT ASSESS SubOptime 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of populations; presence	Mu Ma	10-30% gradiel stable available desirate frequent	Black very finorganic matter organic matter organic matter of the properties of the	TREAN  10% for low grastable habitat substra	Poor r dient streams) nabitat; lack of is obvious; te unstable or	
Cobble Gravel Sand Silt Clay Hat Parai 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	Greate for low of subsepifaur fish co subme banks, stable to allow	Optimal or than 50% gradient streams) strate favorable for hal colonization & ever; mix of snags, rged logs, undercut cobble or other habitat & at stage	30 15  HABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate r for maintenance of populations; presence additional substrate i	Mu Ma	10-30% gradiel stable available desirate frequent	Black very finorganic matter organic matter organic matter of the properties of the	REAN 10% for low grastable habitat substra	Poor r dient streams) nabitat; lack of is obvious; te unstable or	
Cobble Gravel Sand Silt Clay Hat Parai 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	Greate for low of subsepifaul fish co subme banks, stable to allow potenti	Optimal or than 50% gradient streams) strate favorable for hal colonization & ever; mix of snags, rged logs, undercut cobble or other habitat & at stage v full colonization	30 30 15  HABITAT ASSESS SubOptime 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of populations; presence additional substrate if form of newfall, but n	Mu Ma	10-30% gradiel stable available desirate frequent	Black very finorganic matter organic matter organic matter of the properties of the	REAN 10% for low grastable habitat substra	Poor r dient streams) nabitat; lack of is obvious; te unstable or	
Cobble Gravel Sand Silt Clay Hat Parai 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	Greate for low of subsepifaur fish co subme banks, stable to allow potentithat and	Optimal or than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage v full colonization al (i.e., logs/snags	30 15  HABITAT ASSESS SubOptime 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of populations; presence additional substrate if form of newfall, but m yet prepared for	Mu Ma	10-30% gradiel stable available desirate frequent	Black very finorganic matter organic matter organic matter of the properties of the	REAN 10% for low grastable habitat substra	Poor r dient streams) nabitat; lack of is obvious; te unstable or	
Cobble Gravel Sand Silt Clay Hat Parai 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick citat meter nal	Greate for low of subsepifaur fish co subme banks, stable to allow potentithat and	Optimal or than 50% gradient streams) strate favorable for hal colonization & ever; mix of snags, rged logs, undercut cobble or other habitat & at stage w full colonization al (i.e., logs/snags e not new fall and	30 15  HABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of populations; presence additional substrate if form of newfall, but n yet prepared for colonization (may rate	Mu Ma	10-30% gradiel stable available desirate frequent	Black very finorganic matter organic matter organic matter of the second of the second organic matter of the second organic matter of the second organic matter of the second of the second organic matter of the second or	REAN 10% for low grastable habitat substra	Poor r dient streams) nabitat; lack of is obvious; te unstable or	

2. Pool Substrate Characte	-	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom: little or no root mat: no submerged vegetation.	Hardpan clay of bedrock: no root mat or vegetation.		
Score	10			✓ □ □ □ □			
3. Pool Va	riability	20 19 18 17 16  Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.	15 14 13 12 11  Majority of pools large deep; very few shallow	10 9 8 7 6 Shallow pools much more prevalent than deep pools.	Majority of pools small shallow or pools absent.		
Score	10						
		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 5 4 3 2 1 0		
4.Sedime Deposition		Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.		
Score	15						
		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 5 4 3 2 1 0		
5. Chann Status	el Flow	Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.		
Score	16						
		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 5 4 3 2 1 0		
6. Channel Alteration		Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.		
Score	13						
		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 5 4 3 2 1 0		

	_					1						1			
7. Channe		The bends in the stream increase the stream length 3 to 4 times longer					ds in the s	tream	The ben	ds in the st	ream	Channel straight; waterway has been			
Sinuosity			increase the	stream		increase	the stream	m	increase	the stream	l	waterway l	has been		
			length 3 to 4	times lo	nger	length 2	to 3 times	longer	length 1	to 2 times I	onger	channelize	ed for a lor	ng	
			than if it was	in a stra	ight	than if it	was in a s	traight	than if it	was in a sti	raight	distance.			
			line. (Note -	channel		line.			line.						
			braiding is co	onsidere	d										
			coastal plain	s and oth	ner										
			normal low-ly	ying area	ıs.										
			this paramet	er is not											
			easily rated i	in these											
			areas.)												
Score	7	7						ПП	<u> </u>		<b>7</b>				
			20 19	18 17	7 16	15 1	L4 13	12 11	. 10	9 8	7	6 5 4	3	2 1 (	
						1									
8. Bank S		-	Banks stable	e; eviden	ce	Moderate	ely stable;		Moderat	ely unstable	e; 30-	Unstable; many eroded areas;			
(score eacl	h ban	k)	of erosion or	bank fai	lure	infrequer	nt, small a	reas of	60% of b	oank in reac	h has	"raw" areas frequently along			
Note: determ	ine left	or	absent or mi	nimal; litt	tle	erosion r	nostly hea	aled	areas of	erosion; hi	gh	straight se	ctions and	d bends;	
right side by t	facing		potential for	future		over. 5-3	0% of bar	nk in	erosion	potential du	ring	obvious ba	nk slough	ning;	
downstream.	problems. <5% of bank affected.					reach ha	s areas of	f	floods.			60-100% c	of bank ha	S	
			affected.			erosion.						erosional s	scars.		
Score (LB)		7					4								
			Left Bank	10	9	8	7	6	5	4	3	2	1	С	
Score (RB)		7					<b>4</b>								
	•		Right Bank	10	9	8	7	6	5	4	3	2	1	С	
0. 1/2 22 4 24	·!														
9. Vegetat			More than 90				of the stre			of the strea		Less than			
Protection	-	ore	streambank				rfaces cov			faces cove		streamban			
each bank)			immediate ri		ones	1	vegetation		1 .	ation; disru		covered by	•		
Note: determ	ine left	or	covered by r	native		one class	s of plants	is not	obvious;	patches of	bare	disruption	of streaml	bank	
right side by t	facing		vegetation, i	ncluding		not well i	represente	ed	soil or cl	osely cropp	ed	vegetation	is very hi	gh;	
downstream.			trees, under	story shr	ubs,	disruptio	n evident	but not	vegetation	on common	; less	vegetation	has been	l	
			or nonwoody	/		affecting	full plant	growth	than one	-half of the		removed to	)		
			macrophytes	s; vegeta	tive	potential	to any gre	eat	potential	plant stubb	ole	5 centimet	ers or less	s in	
			disruption th	rough		extent; m	nore than	one-	height re	emaining.		average st	ubble hei	ght.	
			grazing or m	owing		half of th	e potentia	l plant							
			minimal or n	ot eviden	nt;	stubble h	neight rem	aining.							
			almost all pla	ants allov	ved										
			to grow natu	rally.											
Score (LB)		4					П		<u> </u>	<b>7</b>					
ì			Left Bank	10	9	8	7	6	5	4	3	2	1	C	
Score (RB)	)	4		П			П			<b>7</b>					
			Right Bank	10	9	8	7	6	5	4	3	2	1	C	
			J												
10. Ripari	an		Width of ripa	rian zone	е	Width of	riparian z	one 12-	Width of	riparian zo	ne 6-	Width of rip	parian zor	ne <6	
Vegstativ	e Zor	ne	>18 meters;	human		18 meter	rs; human		12 meter	rs; human		meters: litt	le or no ri <sub>l</sub>	parian	
Width (sc	ore ea	ich	activities (i.e	., parking	3	activities	have imp	acted	activities	have impa	cted	vegetation	due to hu	ıman	
bank ripari	an		lots, roadbed	ds. clear-		zone onl	y minimall	V.	zone a g	reat deal.		activities.			
zone)			cuts, lawns,				,	,		,					
20.10)															
Coors // D\	ī		have not imp	Dacted ZC	me.										
Score (LB)		1		<u> </u>	<u> </u>				<u> </u>	<u> </u>	<u> </u>	<u>_</u>	<u> </u>		
(5.5)			Left Bank	10	9	8	7	6	5	4	3	2	1	C	
Score (RB)	)	1	B. I	10	<u> </u>	<u> </u>			<u> </u>	<u> </u>					
			Right Bank	10	9	8	7	6	5	4	3	2	1	С	
TOTAL SCO	RE	109													

Project ID:	Somerville	South Am	endmen	t 2	Stream Class: Location:				Perennial				
Stream ID:	#9B(45)				Lo	catio	n:		Mack	cey, IN			
Lat:	38.23665	Long:	-87	.35639	Ri۱	er Ba	asin:		Ohio				
Investigators:	Raj, Josh												
Cianotura			Da	ate:	ţ	5-May	/-2011		Reas	on for Sur	vey:		
Signature:			Ti	me:					404 F	unctional	Asses	sment	
WEATHER		Current			Past 2	24-Ho	urs			Heavy rain	n in las	t 7-day	'S
CONDITIONS		Storm (He	avy Rain)		Stor	m (Hea	avy Rair	1)		□NO	✓ Yes	;	
		Rain Stead	dy		Rair	Stead	y			Air Temp	°C		
		☐ Showers (	Intermittent	)	Sho	wers (I	ntermit	tent)		Air Temp	°F	(	<b>6</b> 5
		Cloud Cov	er %		✓ Clou	ıd Cove	er %		90	Other:	•		
		✓ Clear/Sunr	ny		Clea	ır/Sunn	ıy						
CITE LOCATIO		See Attac											
SITE LOCATION	JN/WAP	See Attac	nment										
STREAM		Stream Su	bsystem						Strea	ım Type			
CHARACTERI	ZATION	✓ Perennial	☐ Inter	mittent	□Ep	hemer	al		Со	ldwater			
									✓ w	armwater			
		Stream Or	gin							Catc	hment	Area	
		Upland Ru	ınoff	V	Mixture	of Origi	ins			Mile <sup>2</sup>	2		
		Spring-fed	I/Ground wa		Wetland		Other			Km <sup>2</sup>		0	0.0
WATEROUSE													
WATERSHED		Surroundi	ng Land			_		_		ershed NP			
FEATURES		Forest			mmercia	I		_	eviden			ntial sour	
		Field/Pastu		Otl	ner				vious so	_		ed sedi	ment
		✓ Agriculture		#			_			ershed Ero	sion		
		Residentia	<u>I</u>					No	ne 🔽	Moderate	Heav	'y	
RIPARIAN		Indicate th	e domina	ant type	e and ı	redor	d the	domir	nant s	species pre	esent		
VEGETATION		☐ Trees ✓		Grasse		Herbs	_	None					
(18 meter buff	er)	 Dominant				ag fi	eld.						
	•				<u>.</u>			_					
INSTREAM		Est. Reach	_		ft		m			Canopy C			
FEATURES		Est. Stream			ft		m <sub>2</sub>	0.0		<b>✓</b> Open		artly Ope	
		Sampling F			ft <sup>2</sup>	0	$m^2$	0		Shaded	P.	artly Shad	dedC
		Sampling A		•	mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0					
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water		ft	0.00
		Est. Water	•		in	24.0	m	0.6		High Water		m	0.00
		Surface Ve	locity		ft/s	3.0	m/s	0.9		% of Stream			
				_					Rif	fle %	Rur	า %	
		Channelize	_	☐ No						ol %	Glid	de Pool	
		Dam Prese	ent Myes	<b>✓</b> No	ı				Ste	ep Pool Series			
LARGE WOOD	Y	LWD 0.	.0 m²		<u> </u>	it <sup>2</sup>							
DEBRIS		Donoity of	LWD	m²/kı	m <sup>2</sup>	0 00	00000	2000		ft <sup>2</sup> /mile <sup>2</sup>	Λ	000000	0000
		Density of	LVVD	III /K	111	<u> </u>		000		it /illile	U.		<del>5000</del>

AQUATIO			Indic	ate t	the d	domi	inant	type	and re	ecord th	ne dor	ninant	spec	cies pi	reser	nt					
VEGETA	TION				Emer	_				nergent	_	Rooted		•	V	lone					
			Fr	ee Flo	oating	I		Attac	ched Alg	ae		Floatin	ıg Alga	ae							
			Porti	on o	of the	e rea	ch w	th ac	quatic	vegeta	tion pi	resent					0	%			
WATED	QUALITY		Tom	nora	turo		15	°C	50	°F	\\/ot	ter Od	orc								
WATER	QUALITI		Tem <sub>l</sub> Cond				μs/cn		58	673	1	ler Ou		Пс	ewage	Г	$\neg$	etrole			
					•		Solids		476	mg/l	. —	hemical			naerol			eti Ole	uiii		
			рН	7.9	_	<b>.</b> .	oao			]g,.	<b>—</b> С	, i i ci i i i cai			iacioi	Jic					
			ľ								14/	· · · ·	.f	0:1-							
			Turb	•	_	٦						ter Sur		_	٦.,						
			Cle				ht Tur	bid	✓ Tu			_	She	en [	Glo	bs	Ш	Flec	<b>S</b>		
			L Op	pague	<u> </u>	_ Sta	ined		Oth	ner		Other									
SEDIME			Odo									Depo							_		
SUBSTR	SSTRATE Normal						Sew	-	_	etroleum	1	Sluc	-				aper	fibe	r L	Sa	nd
			Chemical Anaerobic						<u></u> ∐ r	None		<b>✓</b> Reli	ic Shel	ls	Othe	er					
				Other															.1		
			Oils										_	t stone d, are							
				.bsent	. г	Slig	aht		/loderate	. 🗖 .	Profuse	embe	auec	ı, are ∐Ye:		ersiae	95 L		K III	COIC	)
IN	IORGANIC	SURS			_		_		nouerate	<u>;                                    </u>		SANIC	: SUI			COI			NT	S	
Substrate	•						inSa		ina	Subst				cteris							n in
Туре			"		-	Rea			9	Ту									-		
							ICII			ı ıy	ρ <del>c</del>						Ju	···P		nea	ıch
Bedrock						1100	ICII			1	tritus Sticks, wood, coa					e	<u> </u>	p	8	Nea	ıch
Bedrock Boulder	>10"					1100	ICII			1	_			ood, c mater		se	Ju		в	Nea	ich
-	>10" 2.5 - 1					5	;			1	ritus	р	lant		ial	se	Ju	p		Nea	ich
Boulder	2.5 - 1 0.1 - 2	0" .5"				5	; 0			Deti Mu Mi	ritus ck- ud	p B	lant lack rgan	mater very fi ic mat	ial ine ter	se				Nea	ich
Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2 gritty	0" 5"				5 40	5 0 0			Deti	ritus ck- ud	p B	olant lack rgan Grey	mater very fi ic mat y, she	ial ine ter II	se				nea	ich
Boulder Cobble Gravel Sand Silt	2.5 - 1 0.1 - 2 gritty gooe	0" 5" ,				5	5 0 0			Deti Mu Mi	ritus ck- ud	p B	olant lack rgan Grey	mater very fi ic mat	ial ine ter II	se				nea	nch
Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2 gritty	0" 5" ,				5 40 30 25	5 0 0 5			Mu Mu Ma	ck- ud arl	B O	olant lack rgan Grey frag	mater very fi ic mat y, she ments	ial ine ter II					Ned	nch
Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe	0" 5" ,				5 40 30 25	5 0 0 5 <b>BITA</b>			Mu Mu Ma	ck- ud arl	B O	lant lack rgani Grey frag	mater very fi ic mat y, she ments	ial ine ter II		<u> </u>			Nea	nch
Boulder Cobble Gravel Sand Silt Clay Hall	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter	0" 5" y		tima		5 40 30 25 <b>HA</b>	5 0 0 5 <b>BITA</b>	Sub	Optim	Mu Mu Ma	ck- ud arl	B O W GRA	olant lack rgani Grey frag	mater very fi ic mat y, she ments	ial ine ter II S	AMS	<u> </u>	Pod		Nea	nch
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y	er than	50%		30 25 HA	5 0 0 5 <b>BITA</b>	Sub( 6 for lo	<b>Optim</b> ow	Mu Mu Ma Ma Ma	ck- ud arl	B O O O O O O O O O O O O O O O O O O O	lack rgani Grey frag	mater very fi ic mat y, she ments	ial ine ter II S	AMS	3	Poo	or	ned	ich
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y	er than gradie	50% ent str	<b>I</b>	55 44 36 25 <b>HA</b>	6 0 0 5 <b>BITA</b> 30-50%	Sub( 6 for lo	Optim ow ams) m	Mu Mu Ma Ma Ma Ma	ck- ud arl	W GRA Març % for lov	lack rgan Grey frag  ADIN ginal	mater very fi ic mat y, she ments IET S	ial ine iter III is	AMS  o for gradie	s ent st	Poc	DDT	ned.	ich
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O" 5"  Greate for low of subs	er than gradie strate fa	50% ent str	eams	55 40 30 29 <b>HA</b>	BITA 30-50% gradier stable	Sub( 6 for long the strest the strest that the strest that the strest the street the str	Optim ow ams) m t; well-s	Mu Mu Ma Ma Ma Ma	ck- ud arl	W GRAMATE March habitat;	lant lack rgani Grey frag  ADIN ginal w ms) m habita	mater very fi ic mat y, she ments  IET S	ial ine ter II S TRE	AMS ofor gradie	ent st	Poc	DDT	Ned	ich
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur	er than gradie strate fa	50% ent str avora onizat	reams	5 40 30 29 <b>HAA</b>	BITA 30-50% gradier stable for full	Sub( 6 for long that strest habitan coloni	Optimow ams) m t; well-s zation	Mu Mi	ck- ud arl	W GRA Març % for low nt strean habitat; bility less	lant lack rgani Grey frag  ADIN ginal w habita s than	mater very fi ic mat y, she ments  IET S	ial ine tter II s TRE low stab	AMS  for gradie le hab tat is	ent st	Poc	Dr ns)	Ned	ich
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish co	er than gradie strate fa nal colo ver; mi	50% ent stra avora onizat ix of s	eams ble fo tion & snags,	5 44 33 29 <b>HA</b>	BITA 30-50% gradier stable for full potenti	Sub(6 for long street for long)  A for long street for long st	Optim  ow  ams) m  t; well-s  zation  equate l	Mu Mi	ck- ud arl 10-309 gradie stable availal desiral	W GRA Març % for lov nt stream habitat; bility less ble; subs	ADIN ms) m habita s than	mater very fi ic mat y, she ments  IET S  ix of at	ial ine ine tter III s TRE low s stab habi subs	AMS  for gradie le habitat is of trate	ent st	Poc	Dr ns)	Ned	ich
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish consubme	er than gradie strate fa nal colo ver; mi	50% ent stravora conizationization of s ogs, u	reams able fo tion & snags, nderc	54 36 29 <b>HA</b>	30-50% gradier stable for full potenti	Sub(6 for lofe that streethabital colonical; additional)	Optim  ow  ams) m  t; well-s  zation  equate I  nce of	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Març % for low nt stream habitat; bility less ble; sub-	ADIN ms) m habita s than	mater very fi ic mat y, she ments  IET S  ix of at	ial ine tter II s TRE low stab	AMS  for gradie le habitat is of trate	ent st	Poc	Dr ns)	Ned	ich
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish co	er than gradie strate fa nal colo ver; mi erged lo	50% ent str avora onizat ix of s ogs, u	reams able for tion & snags, underconther	5 40 33 29 <b>HA</b>	BITA 30-50% gradier stable for full potenti for mai	Subtement streethabitations;	Optim  ow  ams) m  t; well-s  zation  equate l	Mu Mu Ma	ck- ud arl 10-309 gradie stable availal desiral	W GRA Març % for low nt stream habitat; bility less ble; sub-	ADIN ms) m habita s than	mater very fi ic mat y, she ments  IET S  ix of at	ial ine ine tter III s TRE low s stab habi subs	AMS  for gradie le habitat is of trate	ent st	Poc	Dr ns)	Ned	nch
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish cosubme banks,	er than gradie gradie strate fa nal colo ver; mi gradie cobble	50% ent strandarder favorationizationizationizationi favorationiz	reams able fo tion & snags, nderc ther stage	5 44 30 29 HA	BITA 30-50% gradier stable for full potenti for mai popula additio	Subtempt streethabital colonial; additions; mal su	Optimow ams) m t; well-s zation equate I nce of	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Març % for low nt stream habitat; bility less ble; sub-	ADIN ms) m habita s than	mater very fi ic mat y, she ments  IET S  ix of at	ial ine ine tter III s TRE low s stab habi subs	AMS  for gradie le habitat is of trate	ent st	Poc	Dr ns)	Ned	ich
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable	er than gradie strate fa nal colo ver; mi gradie cobble habitat	50% ent strandard strandar	reams able fo tion & snags, underc ther stage	54436 3629 HA	BITA 30-50% gradier stable for full potenti for mai popula additio	Subo for lo for lo for lo habita coloni al; add ntena tions; nal su	Optimow ams) m ams) m t; well-s zation equate l nce of presence bstrate all, but r	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Març % for low nt stream habitat; bility less ble; sub-	ADIN ms) m habita s than	mater very fi ic mat y, she ments  IET S  ix of at	ial ine ine tter III s TRE low s stab habi subs	AMS  for gradie le habitat is of trate	ent st	Poc	Dr ns)	Ned	nch
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allow	er than gradie strate fi nal cold ver; mi erged lo cobble habitat w full co	50% ent strander favorationization ix of stogs, under or of t & at olonization, logs/	ll labeled and see a see	5 44 30 29 HA	BITA 30-50% gradier stable for full potenti for mai popula additio form of	Subtempt of the street of the	Optimow ams) m ams) m t; well-s zation equate l nce of presence bstrate all, but r	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Març % for low nt stream habitat; bility less ble; sub-	ADIN ms) m habita s than	mater very fi ic mat y, she ments  IET S  ix of at	ial ine ine tter III s TRE low s stab habi subs	AMS  for gradie le habitat is of trate	ent st	Poc	Dr ns)	Ned	ich
Boulder Cobble Gravel Sand Silt Clay  Hall Para  1. Epifaut Substrat Available Cover	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal e/	O"  5"  Greate for low of subsepifaur fish cosubme banks, stable to allow potentit that are	er than gradie strate fi nal cold ver; mi erged lo cobble habitat w full co	50% ent str favora onizat ix of s ogs, u e or of t & at oloniz , logs/ new fa	ll labeled and see a see	5 44 30 25 HA	BITA 30-50% gradier stable for full potenti for mai popula additio form of	Sub(6 for lot of the street habital colonial; additions; mal substitutions; pared cation	Optimow ams) m t; well-s zation equate l nce of presence bstrate all, but r for (may ra	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Març % for low nt stream habitat; bility less ble; sub-	ADIN ms) m habita s than	mater very fi ic mat y, she ments  IET S  ix of at	ial ine ine tter III s TRE low s stab habi subs	AMS  for gradie le habitat is of trate	ent st	Poc	Dr ns)	Ned	ich
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greater for low of subsepifaur fish consubanks, stable to allow potentiat and not train	er than r gradie strate fi nal colo ver; mi rged lo cobble habitat w full co ial (i.e., e not n nsient)	50% ent str avora onizat ix of s ogs, u e or o t & at oloniz , logs/	ll labeled and see a see	5 44 30 25 HA	BITA 30-50% gradier stable for full potenti for mai additio form of yet pre coloniz high er	Sub(6 for lot of the street habital colonial; additions; mal substitutions; pared cation	Optimow  ams) m  t; well-s  zation  equate I  nce of  presence bstrate  all, but r  for  (may ra  scale).	Mu Mu Ma	ck- ud arl  10-309 gradie stable availat desira freque remov	W GRA Març % for lov nt strean habitat; bility less ble; sub- intly dist ed.	ADIN ms) m habita s than	mater very fi ic mat y, she ments  IET S  ix of at	ial ine ine tter III s TRE low s stab habi subs	AMS  for gradie le habitat is of trate	ent st	Poc	of or	2	1 (

	, , , , , , , , , , , , , , , , , , ,
2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: no
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged
	mats and submerged vegetation.
	vegetation common. vegetation present.
Score 11	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small
1	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.
	small-deep pools present. few shallow pools.
Score 10	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4.Sediment	Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine
Deposition	of islands or point bars bar formation, mostly new gravel, sand or fine material, increased bar
	and less than <20% of from gravel, sand or fine sediment on old and new development; more than
	the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom
	sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools
	deposition in pools. deposits at obstructions, almost absent due to
	constrictions, and bends; substantial sediment
	moderate deposition of deposition.
	pools prevalent.
Score 14	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
5. Channel Flow	Water City of the Water City o
	Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in
Status	both lower banks, and available channel; or available channel, and/or channel and mostly
	mimimal amount of <25% of channel riffle substrates are present as standing pools.
	channel substrate is substrate is exposed. mostly exposed.
0 10	exposed.
Score 13	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6. Channel	Channelization or Some channelization Channelization may be Banks shored with gabion
Alteration	dredging absent or present, usually in areas extensive; embankments or cement; over 80% of
	minimal; stream of bridge abutments; or shoring structures the stream reach
	with normal evidence of past present on both banks; channelized and disrupted.
	pattern. channelization, i.e., and 40 to 80% of stream Instream habitat greatly
	dredging, (greater than reach channelized and altered or removed
	past 20 yr) may be disrupted. entirely.
	present, but recent
	channelization is not
	present.
Score 13	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
	120 13 10 17 10 13 17 13 12 11 10 3 0 7 0 3 7 3 2 1 0

7. Channel		The bends in t	the strean	n	The bends	in the str	eam	The bends	in the stre	am	Channel stra	aight;	
Sinuosity		increase the s	tream		increase th	e stream		increase th	e stream		waterway ha	is been	
		length 3 to 4 ti	imes long	er	length 2 to	3 times lo	onger	length 1 to	2 times lo	nger	channelized	for a long	g
		than if it was in	n a straigl	nt	than if it wa	as in a str	aight	than if it wa	s in a stra	ight	distance.		
		line. (Note - ch	nannel		line.			line.					
		braiding is cor	nsidered										
		coastal plains		r									
		normal low-lyi											
		this parameter	Ū										
		easily rated in											
		areas.)											
Score 6	,		7 🗖	П		пг	<del></del>	<del></del>		7 🔽		пп	$\neg$ $\neg$
00010	,	20 19 1	8 17	<u>1</u> 6	15 14	13	<u> </u>	 10	<u> </u>	<u></u> 7	6 5 4 3 2 1		
		20 19 1	.0 17	10	13 12	+ 13	12 13	. 10	9 0		0 3 <del>4</del>	·	2 1
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable;	30-	Unstable; ma	any erod	ed areas;
(score each ban	ık)	of erosion or b	infrequent,	small are	eas of	60% of ban	k in reach	has	Unstable; many eroded areas; "raw" areas frequently along				
Note: determine left	or	absent or mini	erosion mo	stly heale	ed	areas of er	osion; high	1	straight sect	ions and	bends;		
right side by facing		potential for fu	ıture		over. 5-309	% of bank	cin	erosion pot	_		obvious ban		
downstream.		problems. <5%			reach has			floods.		J	60-100% of	J	٠ <i>,</i>
		affected.			erosion.						erosional sc		
Score (LB)	7		$\overline{}$	$\overline{}$		<u> </u>	$\neg$	$\vdash$	$\neg$	$\overline{}$			
000.0 (22)	•	Left Bank	10	9	8	7	6	<u></u>	4	3	2	1	
Score (RB)	7	Left Barik	$\overline{\Box}$	ŕ	$\overline{}$	<u> </u>	$\overline{\Box}$		$\overline{}$	$\overline{\Box}$		<del></del>	
Score (IVD)		Diah+ Dank	10	9	<u> </u>	_ <u> </u>	<u> </u>	<u></u>	4	3	<u></u>	 1	
		Right Bank	10	9	<u> </u>		- 0	<u> </u>	4				
9. Vegetative		More than 90%	% of the		70-90% of	the strea	m-	50-70% of	the stream	<b>)-</b>	Less than 50	0% of the	
Protection (sco	ore	streambank si	urfaces ar	nd	-bank surfa	aces cove	ered	bank surfac	es covere	ed	streambank	surfaces	
each bank)		immediate ripa	arian zone	es	by native v	egetation	, but	by vegetati	on; disrup	tion	covered by v	/egetatio	n;
Note: determine left	or	covered by na	itive		one class of	•		obvious; pa	•		disruption of	•	
right side by facing		vegetation, inc			not well rep	•		soil or close			vegetation is very high;		
downstream.		trees, underst	-	s	disruption			vegetation			vegetation h		,
downou cam.		or nonwoody	ory ornab	Ο,	affecting fu			than one-ha	-	1000	removed to	45 50011	
		macrophytes;	vegetativ	Δ	potential to			potential pl		2	5 centimeter	e or lees	in
		disruption thro	Ū	<b>C</b>	ľ					<del>-</del>			
		·			extent; mo			height rema	allilig.		average stul	ble rieig	rit.
		grazing or mo	•		half of the								
		minimal or not	-		stubble hei	ignt rema	ining.						
		almost all plar		d									
0 (1.5)	_	to grow natura	ally.		L			L					
Score (LB)	2			Ť	<u> </u>	Щ_	<u> </u>	<u> </u>	<u> </u>	Щ_	☑	Ц_	
O (DD)	_	Left Bank	10	9	8		6	5	4	3	2	1_	_
Score (RB)	2	D: 1 - D - 1	<u> </u>	<u> </u>	<u> </u>	_닠_	<u> </u>	<u> </u>	<u> </u>		<u> </u>		Ш
		Right Bank	10	9	8	7	6	5	4	3	2	1	
10. Riparian		Width of ripari	an zone		Width of rip	oarian zor	ne 12-	Width of rip	arian zon	e 6-	Width of ripa	rian zone	e <6
Vegstative Zor	ne	>18 meters; h			18 meters;			12 meters;			meters: little		
Width (score ea							otod	1		lod.		•	
· ·	acii	activities (i.e.,	-		activities ha			activities ha		leu	vegetation d	ue to nui	IIaII
bank riparian		lots, roadbeds			zone only r	minimally.		zone a grea	at deal.		activities.		
zone)		cuts, lawns, or	r crops)										
		have not impa	cted zone	€.									
Score (LB)	1											$\checkmark$	
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	1											<b>✓</b>	
		Right Bank	10	9	8	7	6	5	4	3	2	1	
TOTAL SCORE	98												

Project ID:	Somerville	t 2	Stream Class: Location:				Ephemeral						
Stream ID:	#13(32)				Lo	catio	n:		Mack	key, IN			
Lat:	38.23338	Long:	-87	7.34459	Riv	er B	asin:		Ohio	)			
Investigators:	Nate Nola	nd											
Signature:			D	ate:		5-May	/-2011			on for Su			
Oigilatare.			Ti	ime:			3:5	56 PM	404 F	Functional	Asses	sment	
_		1								1			
WEATHER		Current			Past 2	_				Heavy rai		-	'S
CONDITIONS		l '	eavy Rain)			-	avy Rair	n)		□NO	✓ Yes		
		Rain Stea	-		Rair		-			Air Temp			18
		Showers	-	t)		-	Intermit	tent)		Air Temp	°F		65
		Cloud Cov			☑ Clou				90	Other:			
		✓ Clear/Sun	ny		Clea	ır/Sunr	ny						
SITE LOCATION	ON/MAP	See Atta	chment							ı			
STREAM		Stream Su			_					am Type			
CHARACTERI	ZATION	Perennial	Inte	rmittent	<b>∠</b> Ep	hemer	al			oldwater			
									✓W	armwater		_	
		Stream O	_								chment		
		Upland R			Mixture	_				Mile		_	.01
		Spring-fee	d/Ground wa	ater	Wetland		Other			Km <sup>2</sup>		0	0.0
WATERSHED		Surroundi	ing Land	use & l	Percen	tage		Loca	l Wat	ershed NF	S Pollu	untion	
FEATURES		Forest		☐ Co	mmercia	ı		□No	eviden	ce So	ome potei	ntial sour	ces
		☐ Field/Past	ure	✓ Ot	her		20	<b>✓</b> Ob	vious s	ources Ag	. induc	ed sedi	ment
		✓ Agricultur	e <b>80</b>	% <u>Log</u> g	ed mi	ne la	<u>nd</u>	Loca	l Wat	ershed Er	osion		
		Residentia	al					☐ Nor	ne 🔽	Moderate	Heav	/y	
RIPARIAN		Indicate th	aa damin	ant tun	o and i	radar	d tha	domir	ant c	anaoiaa nr	ocont		
VEGETATION		Indicate th		Grass		Herbs		None	iaiit	species pr	esent		
(18 meter buff		Dominant		_	_				r an	field mini	ina hau	ıl road	
(10 meter bun	(CI)						geu c	orrido	i, ag	neia, iiiiii	ing nau	ii i oau	
INSTREAM		Est. Reach	n Length		ft		m	0		Canopy C	Cover		
FEATURES		Est. Strear			ft		m	0.0		✓ Open	□P	artly Ope	n
		Sampling I			ft <sup>2</sup>	0	m <sup>2</sup>	0		Shaded	□P	artly Shad	dedC
		Sampling /		2	mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0					
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water	r Mark	ft	0.00
		Est. Water	•		in	1.0	m	0.0		High Water	r Mark	m	0.00
		Surface Ve	elocity		ft/s	n/a	m/s	####		% of Stream	m Morph	ology	
									Rif	fle %	Rui	n %	
		Channelize	_						Po	ol %	Glid	de Pool	
		Dam Prese	ent <sub>Yes</sub>	✓ No	)				Ste	ep Pool Series	i		
LARGE WOOD	Y	LWD 1	<u>.4</u> m²	1	15 1	ft²							
		Density of	f I WD	m²/k	m²	0.00	00013	3935		ft²/mile²	0	იიიიი	5381

AQUATIO	С		Indicate the don	ninant type and re	cord th	ne don	ninant species pr	esent	
VEGETA	TION		✓ Rooted Emergen	t Rooted Subm	ergent		Rooted Floating	☐ None	2
			☐ Free Floating	Attached Alga	ae		Floating Algae		
			Portion of the re	ach with aquatic	vegetat	tion pr	esent		25 %
				·		ilon pi	Coont		20 70
WATER	QUALITY		Temperature	21.4 °C 70.5		1	er Odors		_
			Conductivity	μs/cm	519	. —	ormal/None Se	•	Petroleum
			Total Dissolved	Solids 367	mg/l	Шс	hemical An	aerobic	
			pH <b>8.1</b>						
			Turbidity			Wat	er Surface Oils		
			☐ Clear ✓ Sli	ight Turbid 🔲 Tur	bid		Slick Sheen	Globs	Flecks
			Opague St	ained Oth	er		Other		
SEDIME	NT/		Odors				Deposits		
SUBSTR	ATE		Normal	Sewage P	etroleum		☐ Sludge ☐ Sawd	dust _	Paper fiber Sand
			Chemical	✓ Anaerobic			Relic Shells	Other	
			Other						
							Looking at stone	s whic	h are not deeply
			Oils				embedded, are ι	ındersi	des black in color?
			✓ Absent S	light Moderate	- DP	Profuse	Yes		□No
-	•	SUBS	STRATE COMPO	ONENTS		ORG	SANIC SUBSTRA	ATE C	OMPONENTS
Substrate	Diamet	ter	-	e inSampling	Subst		Characteris	tic	% Composition in
Type			Da		T				C   ! D  -
			Re	ach	Ty				Sampling Reach
Bedrock	4.0.11		Ke	ach	Detr		Sticks, wood, co		Sampling Keach
Bedrock Boulder	>10"		Re	ach	Detr	itus	plant materi	al	Sampling Reach
Bedrock Boulder Cobble	2.5 - 1	0"			Detr Mu	itus ck-	plant materi Black very fir	al ne	Sampling Reach
Bedrock Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" .5"		5	Detr Mu Mu	ck- ud	plant materi Black very fii organic matt	al ne er	Sampling Reach
Bedrock Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2. gritty	0" 5"	3	5 30	Detr Mu	ck- ud	plant materi Black very fii organic matt Grey, shell	al ne er	Sampling Reach
Bedrock Boulder Cobble Gravel Sand Silt	2.5 - 1 0.1 - 2. gritty gooe	0" 5" ,	3	5	Detr Mu Mu	ck- ud	plant materi Black very fii organic matt	al ne er	Sampling Reach
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe slick	0" 5" ,		5 30 65	Detr Mu Mu Ma	ck- ud	plant materi Black very fii organic matt Grey, shell fragments	al ne er	
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe slick	0" 5" ,	3 6	5 30 65 ABITAT ASSESS	Mud Mu Ma Ma	ck- ud	plant materi Black very fii organic matt Grey, shell fragments	al ne er	IS
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Para	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter	0" 5" y	HA Optimal	5 30 65 ABITAT ASSESS SubOptima	Mud Mu Ma Ma	itus ck- ud arl	plant materi Black very fir organic matt Grey, shell fragments W GRADINET ST Marginal	al ne er	IS Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5" y	HA Optimal r than 50%	5 30 65 ABITAT ASSESS SubOptima 30-50% for low	Mu Mu Ma Ma MENT	ck- ud arl - LOV	plant materi Black very fii organic matt Grey, shell fragments  W GRADINET ST Marginal	al ne er REAM	IS Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Paral 1. Epifaul Substrat	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5" y Greate	HA Optimal r than 50% gradient streams)	5 30 65  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix	Mu Mu Ma Ma MENT al	ck- ud arl - LOV 10-30% gradier	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal 6 for low and streams) mix of	REAM	IS Poor dient streams)
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5"  Greate for low of subs	H/Optimal r than 50% gradient streams) strate favorable for	5 30 65 ABITAT ASSESS SubOptima 30-50% for low	Mu Mu Ma Ma MENT al	ck- ud arl - LOV 10-30% gradier stable	plant materi Black very fii organic matt Grey, shell fragments  W GRADINET ST Marginal for low ht streams) mix of habitat; habitat	REAM  10% for low grad stable h	Poor dient streams) abitat; lack of
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Paral 1. Epifaul Substrat	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur	HA Optimal r than 50% gradient streams)	5 30 65 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix stable habitat; well-su	Mu Mu Ma	ck- ud arl  - LOV  10-30% gradier stable availab	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal 6 for low and streams) mix of	REAM  10% for low grad stable h habitat i	IS Poor dient streams)
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish co	HA Optimal r than 50% gradient streams) strate favorable for that colonization &	5 30 65  ABITAT ASSESS SubOptima 30-50% for low gradient streams) minustable habitat; well-streams for full colonization	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low and streams) mix of habitat; habitat bility less than	REAM  10% for low grad stable h habitat i	Poor dient streams) abitat; lack of is obvious;
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O" 5"  Greate for low of subs epifaur fish co subme	H/Optimal In than 50% gradient streams) strate favorable for that colonization & ever; mix of snags,	5 30 65 SubOptima 30-50% for low gradient streams) mis stable habitat; well-st for full colonization potential; adequate h	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks,	Optimal r than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, rged logs, undercut	5 30 65  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of	Mu Mu Ma	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable	HAD Optimal  Than 50%  gradient streams)  strate favorable for all colonization & ver; mix of snags, rged logs, undercut cobble or other	5 30 65 SubOptima 30-50% for low gradient streams) mis stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence	Mu Ma	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allov	The strate favorable for all colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage	5 30 55  ABITAT ASSESS SubOptime 30-50% for low gradient streams) mix stable habitat; well-so for full colonization potential; adequate h for maintenance of populations; presence additional substrate i	Mu Ma	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti	Than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage v full colonization	5 30 65  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n	Mu Ma	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubme banks, stable to allow potentithat are	HAD Optimal In than 50% gradient streams) strate favorable for that colonization & ever; mix of snags, arged logs, undercut cobble or other thabitat & at stage we full colonization all (i.e., logs/snags)	5 30 55 SubOptima 30-50% for low gradient streams) mix stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for	Mu Ma	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;

2. Pool	Mixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no				
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.				
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged					
	mats and submerged	and submerged	vegetation.					
	vegetation common.	vegetation present.						
Score 6								
•	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small				
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.				
	small-deep pools present.	few shallow	pools.					
Score 1								
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 (				
4.Sediment	1.201	0	Madagata daga Starat					
	Little or no enlargement	Some new increase in	Moderate deposition of	Heavy deposits of fine				
Deposition	of islands or point bars	bar formation, mostly	new gravel, sand or fine	material, increased bar				
	and less than <20% of	from gravel, sand or fine	sediment on old and new	development; more than				
	the bottom affected by	sediment; 20-50% of the	bars; 50-80% of the	80% of the bottom				
	sediment deposition.	bottom affected; slight	bottom affected; sediment	changing frequently; pools				
		deposition in pools.	deposits at obstructions,	almost absent due to				
			constrictions, and bends;	substantial sediment				
			moderate deposition of	deposition.				
				deposition.				
		<u> </u>	pools prevalent.					
Score 16								
Score 16	20 19 18 17 16	15 14 13 12 11		6 5 4 3 2 1 0				
Score 16  5. Channel Flow	+	15 14 13 12 11 Water fills >75% of the						
	20 19 18 17 16  Water reaches base of	Water fills >75% of the	10 9 8 7 Water fills 25-75% of the	Very little water in				
5. Channel Flow	20 19 18 17 16		10 9 8 7	Very little water in channel and mostly				
5. Channel Flow	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of	Water fills >75% of the available channel; or <25% of channel	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are	Very little water in				
5. Channel Flow	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is	Water fills >75% of the available channel; or	10 9 8 7 Water fills 25-75% of the available channel, and/or	Very little water in channel and mostly				
5. Channel Flow	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of	Water fills >75% of the available channel; or <25% of channel	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are	Very little water in channel and mostly				
5. Channel Flow Status	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status Score 3	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status  Score 3  6. Channel	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16  Channelization or	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status Score 3	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas	U U U U U U U U U U U U U U U U U U U	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status  Score 3  6. Channel	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  D D D D D D Channelization or dredging absent or minimal; stream	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas of bridge abutments;	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be extensive; embankments or shoring structures	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status  Score 3  6. Channel	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas of bridge abutments; evidence of past	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks;	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status  Score 3  6. Channel	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  D D D D D D Channelization or dredging absent or minimal; stream	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e.,	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream	Very little water in channel and mostly present as standing pools.  D D D D D D D D D D D D D D D D D D D				
5. Channel Flow Status  Score 3  6. Channel	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status  Score 3  6. Channel	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream	Very little water in channel and mostly present as standing pools.  D D D D D D D D D D D D D D D D D D D				
5. Channel Flow Status  Score 3  6. Channel	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status  Score 3  6. Channel	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status  Score 3  6. Channel Alteration	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	10 9 8 7  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Very little water in channel and mostly present as standing pools.				
5. Channel Flow Status  Score 3  6. Channel	20 19 18 17 16  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11  Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Very little water in channel and mostly present as standing pools.				

7. Channel		The beauties to a			The state of the 1	. () (.		Tt - 1 1-			01	tale (	1
		The bends in t		1	The bends in			The bends		eam	Channel stra	•	
Sinuosity		increase the s			increase the			increase the			waterway ha		
		length 3 to 4 ti	•		length 2 to 3		•	length 1 to		Ū	channelized	for a long	g
		than if it was in	•	nt	than if it was	s in a str	aight	than if it wa	s in a stra	aight	distance.		
		line. (Note - ch			line.			line.					
		braiding is cor	nsidered										
		coastal plains	and other	•									
		normal low-lyi	ng areas.										
		this parameter	r is not										
		easily rated in	these										
_		areas.)											
Score 6	3												
		20 19 1	.8 17	16	15 14	13	12 11	. 10	9 8	7	6 5 4 3 2 1		
9 Pank Stabil	i4.,	Darelia etablar			Moderately stable;			Madanatal		. 20	Unstable: many eroded areas:		
8. Bank Stabil	-	Banks stable;			•		(	Moderately			Unstable; many eroded areas;		
(score each bar	•	of erosion or b	infrequent, s			60% of ban			"raw" areas frequently along				
Note: determine left	or	absent or mini	•	erosion mos	•		areas of ero			straight sections and bends;			
right side by facing						of bank	cin	erosion pot	ential dur	ing	obvious bank sloughing;		
downstream.		'	reach has a erosion.	reas of		floods.			60-100% of				
- "->	affected.							L			erosional sc	ars.	
Score (LB)	6						$\checkmark$						
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	6						<b>✓</b>						
		Right Bank	10	9	8	7	6	5	4	3	2	1	
9. Vegetative		More than 90%	% of the		70-90% of th	na etraa	m-	50-70% of t	ha etraar	n_	Less than 50	n% of the	
Protection (sc	ore	streambank si		٠.d	-bank surfac						streambank		
,	OI C							bank surfac					_
each bank)		immediate ripa		es	by native ve	-		by vegetation			covered by	•	
Note: determine left	tor	covered by na			one class of	•		obvious; pa			disruption of		
right side by facing		vegetation, inc	•		not well repr			soil or close			vegetation is very high;		
downstream.		trees, underst	ory shrubs	3,	disruption ev			vegetation		less	vegetation h	as been	
		or nonwoody			affecting full	plant gi	rowth	than one-ha			removed to		
		macrophytes;	vegetative	Э	potential to	any grea	at	potential pla	ant stubb	е	5 centimeter	s or less	in
		disruption thro	ugh		extent; more	than o	ne-	height rema	aining.		average stul	oble heigl	ht.
		grazing or mo	wing		half of the po	otential	plant						
		minimal or not	evident;		stubble heig	ht rema	ining.						
		almost all plar	nts allowed	b									
		to grow natura	ally.										
Score (LB)	5							<b>✓</b>					
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	5							V					
		Right Bank	10	9	8	7	6	5	4	3	2	1	
40 5: :													
10. Riparian		Width of ripari	an zone		Width of ripa	arian zoi	ne 12-	Width of rip	arian zon	e 6-	Width of ripa		
Vegstative Zo		>18 meters; h	uman		18 meters; h	numan		12 meters;	human		meters: little	or no rip	arian
Width (score e	ach	activities (i.e.,	parking		activities hav	ve impa	cted	activities ha	ve impac	ted	vegetation d	ue to hur	nan
bank riparian		lots, roadbeds	, clear-		zone only m	inimally		zone a grea	at deal.		activities.		
zone)		cuts, lawns, o	r crops)										
,		have not impa	• /	).									
Score (LB)	1	22		<u></u>		П			П	$\Box$		$\overline{\checkmark}$	$\neg$
	•	Left Bank	10	9	<u> </u>	<u> </u>	<u> </u>	 5	4	_ <u></u> _3		<u> </u>	
Score (RB)	1	LCIT DAIIN		$\overline{}$	$\overline{\Box}$	$\overline{}$	$\overline{\Box}$	$\overline{\Box}$				<u> </u>	$\overline{}$
COOLS (IVD)	•	Right Bank	<u> </u>	9	<u> </u>	7	<u> </u>	<u> </u>	4	<u> </u>	<u></u> 2	<u> </u>	
TOTAL COORE	70	ייופווג טמווג	10	J	U	,	U	<u> </u>	-	<u> </u>		т_	
TOTAL SCORE	72	1											

Project ID:	Somerville	ent 2	Stream Class:				Ephemeral						
Stream ID:	#13(33)				Lo	catio	n:		Mack	cey, IN			
Lat:	38.23346	Long:	-	87.34615	Riv	ver Ba	asin:		Ohio				
Investigators:	Nate Nola	nd											
O'mm at				Date:	;	5-May	/-2011		Reas	on for Sur	vey:		
Signature:				Time:			4:0	4 PM	404 F	unctional	Asses	sment	
			•										
WEATHER		Current			Past 2	24-Ho	urs			Heavy rain	n in las	t 7-day	'S
CONDITIONS		Storm (H	eavy Rain)	)	Sto	rm (Hea	avy Rair	1)		□NO	<b>✓</b> Yes	5	
		Rain Stea	ıdy		Rair	n Stead	ly			Air Temp	°C	1	18
		Showers	(Intermitte	ent)	Sho	wers (I	- Intermit	tent)		Air Temp	°F	•	<del>5</del> 5
		Cloud Co	ver %		✓ Clou	ud Cove	er %		90	Other:			
		✓ Clear/Sur	nny		Clea	ar/Sunn	ıy						
			_										
SITE LOCATION	ON/MAP	See Atta	chment										
STREAM		Stream S	ubsvste	m					Strea	am Type			
CHARACTERI	ZATION	Perennial	-	termittent	√ Ft	phemer	al			ldwater			
					<b>—</b> -	p	<b>.</b> .			armwater			
		Stream O	rain								hment	Area	
		Upland R	_		Mixture	of Oria	iins			Mile <sup>2</sup>			.1
		Spring-fe			Wetland		Other			Km <sup>2</sup>		_	.3
							Other						
WATERSHED		Surround	_			_		Loca	l Wat	ershed NP			
FEATURES		✓ Forest		<b>5%</b> □ Co	mmercia	al		No	eviden	ce So	me poter	ntial sourc	es
		Field/Pas	ture	<b>✓</b> Otl	her		25			ources Ag.		ed sedi	ment
		✓ Agricultui	re <b>7</b>	70% <u>Logo</u>	<u>ied are</u>	<u>ea</u>	_	Loca	l Wat	ershed Ero	sion		
		Residenti	al					loN 🗌	ne 🗸	' Moderate	Heav	ry	
RIPARIAN		Indicate t	he domi	inant tyn	and	rador	d the	domir	nant s	species pre	sent		
VEGETATION		Trees		Grasse		Herbs	_	None	iaiit s	ppecies pre	Journ		
(18 meter buff		ı—	_			•	_		ninine	haul road	ı		
(10 meter ban													
INSTREAM		Est. Reacl	n Length	1	ft	1296	m	395		Canopy C	over		
FEATURES		Est. Strea	m Width		ft		m	0.0		✓ Open	□ P.	artly Opei	า
		Sampling			ft <sup>2</sup>	0	$m^2$	0		Shaded	☐ P	artly Shac	ledC
		Sampling		le <sup>2</sup>	mile <sup>2</sup>	0.0	$km^2$	0.0					
		Area in km	າ <sup>2</sup>		mile <sup>2</sup>	0.0	$km^2$	0.0		High Water	Mark	ft	0.00
		Est. Water	Depth		in	3.0	m	0.1		High Water	Mark	m	0.00
		Surface V	elocity		ft/s	0.2	m/s	0.1		% of Stream	n Morph	ology	
									Rif	fle %	Rur	า %	
		Channeliz	ed ∐ <sub>Y</sub>	es 🔽 No	)				Po	ol %	Glio	de Pool	
		Dam Pres	ent 🔲 Y	es 🔽 No	)				Ste	ep Pool Series			
LABOE WOOD		LWD 1	\	n² :	E .	ft <sup>2</sup>							
LARGE WOOD	T	LWDC	).5 m		5	11							
DEBRIS		<b>D</b>	£ 1 14/2	2,	2	0.00	10000	1045		£424 2	^	00000	4704
		Density o	TLWD	m²/k	m	U.UU	00004	+045		ft <sup>2</sup> /mile <sup>2</sup>	U.	000000	1/94

AQUATIO	C		Indicate the don	ninant type and re	cord th	ne don	ninant species pr	esent	
VEGETA	TION		✓ Rooted Emergen	t Rooted Subm	ergent		Rooted Floating	☐ None	2
			☐ Free Floating	✓ Attached Alg	ae		Floating Algae		
			Portion of the re	each with aquatic	vegetat	tion pr	esent		35 %
				•					00 70
WATER	QUALITY		Temperature		°F	1	er Odors		_
			Conductivity	μs/cm	214	. —	ormal/None Se	•	Petroleum
			Total Dissolved	Solids 152	mg/l	Шс	hemical An	aerobic	
			pH <b>6.8</b>						
			Turbidity			Wat	er Surface Oils		
			✓ Clear SI	ight Turbid 🔲 Tur	bid		Slick Sheen	Globs	Flecks
			Opague St	tained Oth	er		Other		
SEDIME	NT/		Odors				Deposits		
SUBSTR	ATE		✓ Normal	☐ Sewage ☐ P	etroleum		☐ Sludge ☐ Sawd	dust _	Paper fiber Sand
			Chemical	Anaerobic N	lone		Relic Shells	Other	
			Other						
							Looking at stone	s whic	h are not deeply
			Oils				embedded, are ι	ındersi	des black in color?
			Absent S	<u> </u>		rofuse	Yes		No
-		SUBS	TRATE COMPO	ONENTS		ORG	SANIC SUBSTRA	ATE C	OMPONENTS
Substrate	Diamet	ter	-	e inSampling	Subst		Characteris	tic	% Composition in
Type			Re	each	Ty	nΔ			Sampling Reach
				acii					Sampling Reach
Bedrock	4.0.11			- Contraction	Detr		Sticks, wood, co		Jamping Reach
Boulder	>10"			each	Detr	itus	plant materi	al	Sampling Reach
Boulder Cobble	2.5 - 1	0"			Detr Mu	itus ck-	plant materi Black very fir	al ne	Sampling Reach
Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" .5"		15	Detr Mu Mu	ck- d	plant materi Black very fii organic matt	al ne er	Jamping Reach
Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2. gritty	0" .5"		15 20	Detr Mu	ck- d	plant materi Black very fii organic matt Grey, shell	al ne er	Jamping Reach
Boulder Cobble Gravel Sand Silt	2.5 - 1 0.1 - 2. gritty gooe	0" .5" ,		15 20 60	Detr Mu Mu	ck- d	plant materi Black very fii organic matt	al ne er	Jamping Reach
Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe slick	0" .5" ,		15 20 60 5	Detr Mu Mu Ma	ck- ud	plant materi Black very fii organic matt Grey, shell fragments	al ne er	
Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe slick	0" .5" ,	H.	15 20 60 5 <b>ABITAT ASSESS</b>	Mud Mu Ma Ma	ck- ud	plant materi Black very fii organic matt Grey, shell fragments	al ne er	IS
Boulder Cobble Gravel Sand Silt Clay  Hat Para	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter	0" 5" y	H. Optimal	15 20 60 5 ABITAT ASSESS	Mud Mu Ma Ma	itus ck- ud arl	plant materi Black very fir organic matt Grey, shell fragments W GRADINET ST Marginal	al ne er	IS Poor
Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5" y	HA Optimal r than 50%	15 20 60 5 ABITAT ASSESS SubOptima 30-50% for low	Mu Mu Ma Ma MENT	ck- ud arl - LOV	plant materi Black very fii organic matt Grey, sheli fragments  W GRADINET ST Marginal	al ne er REAM	IS Poor
Boulder Cobble Gravel Sand Silt Clay  Hat Para  1. Epifaur Substrat	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5" y Greate	HA Optimal r than 50% gradient streams)	15 20 60 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mi	Mu Mu Ma Ma MENT al	ck- ud arl - LOV	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal 6 for low and streams) mix of	REAM	IS Poor dient streams)
Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5"  Greate for low of subs	HA Optimal r than 50% gradient streams) strate favorable for	15 20 60 5 ABITAT ASSESS SubOptima 30-50% for low	Mu Mu Ma Ma MENT al	ck- ud arl - LO\ 10-309 gradier stable	plant materi Black very fii organic matt Grey, shell fragments  W GRADINET ST Marginal for low ht streams) mix of habitat; habitat	REAM  10% for low grad stable h	Poor dient streams) abitat; lack of
Boulder Cobble Gravel Sand Silt Clay  Hat Para  1. Epifaur Substrat	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subs epifaur	HA Optimal r than 50% gradient streams)	15 20 60 5  ABITAT ASSESS SubOptime 30-50% for low gradient streams) mi. stable habitat; well-se	Mu Mu Ma	ck- ud arl  - LOV  10-30% gradier stable availab	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal 6 for low and streams) mix of	REAM  10% for low grad stable h habitat i	IS Poor dient streams)
Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish cov	HA Optimal r than 50% gradient streams) strate favorable for that colonization &	15 20 60 5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-st for full colonization	Mu Ma	ck- ud arl  10-309 gradier stable availab desirat	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low and streams) mix of habitat; habitat bility less than	REAM  10% for low grad stable h habitat i	Poor dient streams) abitat; lack of is obvious;
Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish co subme	HA Optimal In than 50% gradient streams) strate favorable for that colonization & the colonization wer; mix of snags,	15 20 60 5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-streams for full colonization potential; adequate h	Mu Ma	ck- ud arl  10-309 gradier stable availab desirat	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks,	HA Optimal r than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, rged logs, undercut	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-st for full colonization potential; adequate h for maintenance of	Mu Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable	HA Optimal r than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, rged logs, undercut cobble or other	15 20 60 5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-si for full colonization potential; adequate h for maintenance of populations; presence	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allov	HA Optimal  r than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage	ABITAT ASSESS SubOptime 30-50% for low gradient streams) mi stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti	Than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage v full colonization	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mi stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;
Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubme banks, stable to allow potentithat are	Than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage v full colonization al (i.e., logs/snags	ABITAT ASSESS SubOptime 30-50% for low gradient streams) mi stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of is obvious;

	T T T T T T T T T T T T T T T T T T T
2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: no
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged
	mats and submerged and submerged vegetation.
	vegetation common. vegetation present.
Score 6	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small
	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.
	small-deep pools present. few shallow pools.
Score 1	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4.Sediment	Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine
Deposition	of islands or point bars bar formation, mostly new gravel, sand or fine material, increased bar
	and less than <20% of from gravel, sand or fine sediment on old and new development; more than
	the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom
	sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools
	deposition in pools. deposits at obstructions, almost absent due to
	constrictions, and bends; substantial sediment
	moderate deposition of deposition.
	pools prevalent.
Score 18	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
5. Channel Flow	Water file 2770/ of the Water
	Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in
Status	both lower banks, and available channel; or available channel, and/or channel and mostly
	mimimal amount of <25% of channel riffle substrates are present as standing pools.
	channel substrate is substrate is exposed. mostly exposed.
	exposed.
Score 4	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6. Channel	Channelization or Some channelization Channelization may be Banks shored with gabion
Alteration	dredging absent or present, usually in areas extensive; embankments or cement; over 80% of
	minimal; stream of bridge abutments; or shoring structures the stream reach
	with normal evidence of past present on both banks; channelized and disrupted.
	pattern. channelization, i.e., and 40 to 80% of stream Instream habitat greatly
	dredging, (greater than reach channelized and altered or removed
	past 20 yr) may be disrupted. entirely.
	present, but recent
	channelization is not
Score 16	present.
Score 16	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

7. Channel		The bends in t	he stream	1	The bends	in the str	eam	The bends	in the strea	am	Channel stra	aight;	
Sinuosity		increase the s	tream		increase the	e stream		increase the	e stream		waterway ha	is been	
		length 3 to 4 ti	mes longe	er	length 2 to	3 times lo	onger	length 1 to	2 times lor	nger	channelized	for a lon	g
		than if it was ir	n a straigh	ıt	than if it wa	s in a str	aight	than if it wa	s in a strai	ght	distance.		
		line. (Note - ch	nannel		line.		_	line.					
		braiding is con	sidered										
		coastal plains											
		normal low-lyin											
		this parameter	•										
		easily rated in											
		areas.)											
Score 6	<u> </u>	ПГ	1 🗆	П				<del></del>	ПГ	1 🔽			
00010		20 19 1	<u></u> 8 17	<u>1</u> 6	15 14	13	<u></u> 12 11	. 10	<u> </u>	<u>, v</u> 7	6 5 4	<u></u>	2 1
		20 13 1	.0 17	10	13 17	15	12 11	. <u>10</u>	<del>,                                    </del>				2 1
8. Bank Stabil	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable;	30-	Unstable; ma	any erod	ed areas;
(score each bar	ık)	of erosion or b	ank failure	е	infrequent,	small are	eas of	60% of ban	k in reach	has	"raw" areas	frequentl	y along
Note: determine left	t or	absent or mini	mal; little		erosion mo	stly heale	ed	areas of ero	sion; high		straight sect	ions and	bends;
right side by facing		potential for fu	ture		over. 5-30%	6 of bank	in	erosion pot	ential durir	ng	obvious ban	k sloughi	ng;
downstream.		problems. <5%	6 of bank		reach has a	areas of		floods.			60-100% of	bank has	,
		affected.			erosion.						erosional sc	ars.	
Score (LB)	7		ПГ	7	П	<b>V</b>	П	П	П	П	П	П	
, ,		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	7			1	П	$\overline{V}$		П	П	П	П		
(	-	Right Bank	<u>—                                     </u>	9	8	7	6	 5	4	3		1	
		g						Τ	-		<u> </u>		
9. Vegetative		More than 90%	% of the		70-90% of t	the strea	m-	50-70% of t	he stream	-	Less than 50	0% of the	
Protection (sc	ore	streambank su	ırfaces an	d	-bank surfa	ces cove	red	bank surfac	es covere	d	streambank	surfaces	
each bank)		immediate ripa	arian zone	s	by native ve	egetation	, but	by vegetation	on; disrupt	ion	covered by v	egetatio	n;
Note: determine left	t or	covered by na	tive		one class o	f plants i	s not	obvious; pa	tches of ba	are	disruption of	streamb	ank
right side by facing		vegetation, inc	luding		not well rep	resented	l	soil or close	ely cropped	t	vegetation is	very hig	h;
downstream.		trees, understo	ory shrubs	3,	disruption e	evident bu	ut not	vegetation (	common; l	ess	vegetation h	as been	
		or nonwoody			affecting ful	ll plant gr	owth	than one-ha	alf of the		removed to		
		macrophytes;	vegetative	•	potential to	any grea	at	potential pla	ant stubble	<b>;</b>	5 centimeter	s or less	in
		disruption thro	ugh		extent; mor	e than or	ne-	height rema	ining.		average stub	oble heig	ht.
		grazing or mov			half of the p	otential	plant		-				
		minimal or not	•		stubble hei								
		almost all plan		i	•	5	J						
		to grow natura											
Score (LB)	5	J	<u></u>	$\overline{1}$	П	П	П	<u></u>	п	П	П	П	П
(==)		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	5	2010 201111		Ť	$\overline{\Box}$	亡	$\overline{\Box}$	$\overline{\mathbf{V}}$	$\overline{\Box}$	Ť		$\overline{}$	П
(112)		Right Bank	<u> </u>	9	8	7	6	<u></u>	4	3	2	1	
								1					
10. Riparian		Width of riparia	an zone		Width of rip	arian zor	ne 12-	Width of rip	arian zone	6-	Width of ripa	arian zone	e <6
Vegstative Zo	ne	>18 meters; h	uman		18 meters;	human		12 meters;	human		meters: little	or no rip	arian
Width (score e	ach	activities (i.e.,	parking		activities ha	ave impa	cted	activities ha	ve impact	ed	vegetation d	ue to hur	man
bank riparian		lots, roadbeds	. clear-		zone only n	ninimally.		zone a grea	nt deal.		activities.		
zone)		cuts, lawns, or			. , .	,			-				
		,	. ,										
Score (LB)	4	have not impa		<u>.                                    </u>		$\overline{}$			$\overline{}$	$\overline{}$		[7]	$\neg$
Score (LB)	1	Laft Day	<u> </u>		<u> </u>	<u>Ц</u>		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	Ш
Coore (DD)		Left Bank	10	9	8	7	6	5	4	3	2	1_	
Score (RB)	1	Diskup i	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>Ц</u>	<u> </u>	$\boxed{\checkmark}$	
		Right Bank	ΤΩ	9	8	7	6	5	4	3	2	1	
TOTAL SCORE	81												

Project ID:	Somerville	2	Stream Class:				Ephemeral							
Stream ID:	#13A					Lo	catio	n:		Mack	cey, IN			
Lat:	38.23294	Long:		-87	.3458	Riv	ver B	asin:		Ohio				
Investigators:	Will													
Signature:				Dat	:e:	;	5-May	/-2011		Reas	on for Sur	vey:		
Signature.				Tim	ne:			3:4	19 PM	404 F	unctional	Asses	sment	
WEATHER		Current				Past 2	24-Ho	urs			Heavy rain	in las	t 7-day	'S
CONDITIONS		Storm (H	leavy Ra	ain)		Sto	rm (Hea	avy Rair	1)		NO	✓ Yes	5	
		Rain Ste	ady			Rair	n Stead	ly			Air Temp '	Ž	1	18
		Showers	(Interm	ittent)		Sho	wers (I	Intermit	tent)		Air Temp '	'F	•	<b>3</b> 5
		Cloud Co	ver %			<b>✓</b> Clou	ud Cove	er %		90	Other:			
		✓ Clear/Su	nny			Clea	ar/Sunr	ny						
CITE LOCATIO		Coo A44	l	4										
SITE LOCATION	JN/WAP	See Atta	acnme	ent										
STREAM		Stream S	ubsys	tem						Strea	am Type			
CHARACTER	IZATION	Perennia	ıl	Interm	ittent	<b></b> ✓ E	ohemer	al		Со	ldwater			
										✓ Warmwater				
		Stream C	rgin								Catc	hment	Area	
		Upland I	Runoff		abla	Mixture	of Orig	jins			Mile <sup>2</sup>		0.	.04
		Spring-fe	ed/Grou	nd wate	er 🔲	Wetland	d 🔲	Other			Km <sup>2</sup>		0	.1
WATERCHER		C	ا بممال	a.ad	° F		.4		1	I \A/~4.	arabad ND	C Dall.		
WATERSHED		Surround	ing L				_		_		ershed NP			
FEATURES		Forest		15%	Co		al			eviden			ntial sourc	
		Field/Pas		050/	Oth	ner					_		ed sedi	ment
		Agricultu		85%				_			ershed Ero			
		Resident	iai						No	ne <u>L</u> ✓	Moderate	Heav	/y	
RIPARIAN		Indicate t	he do	minaı	nt type	e and	redor	d the	domir	nant s	species pre	sent		
VEGETATION		<b>✓</b> Trees	Shru	os 🗆	Grasse	s $\square$	Herbs		None					
(18 meter buff	fer)	Dominan	t Spec	cies:	Soft	mast f	orest	t, ag fi	eld					
INSTREAM		Est. Read	h Lan	ath		ft	302	m	110		Canopy Co	over		
FEATURES		Est. Strea				ft	332	m	0.0		Open		artly Ope	2
ILATORES		Sampling				ft <sup>2</sup>	0	m <sup>2</sup>	0.0		Shaded		artly Shad	
		Sampling				mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		Snaded	V P	artiy Silat	ieuc
		Area in kr				mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water	Mark	ft	0.00
		Est. Wate		h		in	3.0	m	0.1		High Water		m	0.00
		Surface V	•			ft/s	0.1	m/s	0.0		% of Stream			0.00
		Juliace V	Siderity	,		.,,5	0.1	111/3	0.0	Die	fle %	Rui	•	
		Channeliz	ed F	Yes	✓ No						ol %		de Pool	
		Dam Pres	· ·	] yes ] yes	✓ No						oi % ep Pool Series		ie POOI	
							•			316	h i noi seiles			
LARGE WOOD DEBRIS	Y	LWD	0.0	_m²		)	ft <sup>2</sup>							
		Density o	of LWI	)	m²/kı	m²	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	0.	000000	0000

AQUATIO			Indic	ate t	the c	dom	inant	type	and re	ecord th	ne dor	minant	t spe	cies p	rese	ent						
VEGETA	TION			oted		•				nergent		Roote		•	$\checkmark$	Non	е					
			Fr	ee Flo	oating	)	L	Atta	ched Alo	jae		Floatir	ng Alg	ae								
			Porti	on o	f the	e rea	ach w	ith a	quatic	vegeta	tion p	resent	İ					0	%			
WATER	OHALITY																					
WAIER	QUALITY		Tem <sub>l</sub> Cond				μs/cr	°C	101	°F <b>210</b>	7	ter Od Jormal/I					_	15				
					•		Bolids		140	mg/l	. —	iormai/i Chemica			Sewag Anaer		_	<b>J</b> Pei	roleu	m		
			pН	7.7	_	ou c	Jonas	,	140	<u></u>		лениса	1	ш,	чнаен	UDIC						
				<u> </u>										0.11								
			Turb	•		<b>-</b>					_	ter Su			_			_				
			☑ CI		L		ght Tur	bid	=	rbid		· ·	Sh	een	∐G	lobs		∐F	lecks			
			∐ Op	pague	<u> </u>	Sta	ined		Ot	ner	<u> </u>	Other										
SEDIME			Odo									Depo				_	_			_		
SUBSTR	ATE							age	_	etroleum	1		•	Sav			Pa	per	fiber		Sand	
					ical		Ana	erobic		None		Rel	ic She	ells	Oth	ner						
				Other																		
			Oils										•	t ston							•	,
				bsent	Г	Sli	aht		Moderate	. 🗖	Profuse		eaae	d, are □ <sub>Y</sub> ∈		iers		S DI		in co	SIOI ?	
IN	IORGANIC	SUBS					_		vioderati	; <u>''</u>		GANIC	: SII			F C				JTS		
Substrate	•						inSa		ina	Subst		1					1				ion	in
Туре						Rea			5			strate Characteristi							-			
							1011			ı y	Pu							Jai	ութու	ig iv	each	
Bedrock						1100	icii			1	ritus	Stic	ks, w	ood,	coar	se		Jai	прп	ig iv	each	
	>10"					1100	1011			1	-			ood, mate		se		Jai	<u> </u>	ig iv	each	
Bedrock	>10" 2.5 - 1									1	ritus	ŗ	olant		rial	se		Jai		ig iv	each	
Bedrock Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" 5"				5	j			Deti Mu Mi	ritus ck- ud	F B	olant Black organ	mate very nic ma	rial fine tter	se		<u> </u>		16 11	each	
Bedrock Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2. gritty	0" 5"				5	5			Deti Mu Mi	ritus ck-	F B	olant Black organ Gre	mate very nic ma	rial fine atter	rse		<u> </u>		<u>18 IV</u>	each	
Bedrock Boulder Cobble Gravel Sand Silt	2.5 - 1 0.1 - 2. gritty gooe	0" 5" y				5	5			Deti Mu Mi	ritus ck- ud	F B	olant Black organ Gre	mate very nic ma	rial fine atter	rse		<b>J</b> ai		16 N	each	
Bedrock Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2. gritty	0" 5" y				5 5 4	5 5 0			Mu Mu Mi	ck- ud	E C	olant Black organ Gre fraç	mate very nic ma y, she gment	rial fine atter ell			<u> </u>		16 IV	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe slick	0" 5" y				5 5 4	5 5 0			Mu Mi Mi	ck- ud	B C	olant Black organ Gre fraç	mate very nic ma y, she gment	rial fine atter ell						each	
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter	0" 5" y		tima	1	5 4 HA	5 5 0	Sub	Optim	Mu Mi Mi	ck- ud arl	B C C W GR	olant Black organ Gre fraç ADIN gina	mate very nic ma y, she gment	rial fine atter ell is	ΞΑN	//S		Poor		each	
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaui	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5" y	r than	50%		5 4 HA	5 5 0 BITA	Sub % for l	<b>Optim</b> ow	Mu Mu Mi Mi	ck- ud arl	W GR	olant Black organ Gre frac ADIN gina	mate very nic ma y, she gment	fine atter ell ts	<b>EAN</b> % fo	MS .		Poor		each	
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Paral 1. Epifaul Substrat	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5" y Greate	r than gradie	50% ent str	eams	55 4 HA	5 5 0 <b>BITA</b> 30-509 gradie	Sub % for le	Optimow eams) m	Mu Mu Mi Ma SMENT al	ck- ud arl	W GR Mary % for loo	Black Black organ Gre frac ADIN gina	mate very nic ma y, she gment  NET S	fine atter ell as	<b>EAN</b> % fo	MS radier	<b>F</b>	200n	)	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5"  Greate for low of subs	er than gradie strate fa	50% ent str	eams	### HA	5 0 BITA 30-509 gradie stable	Subon for long the street of t	Optimow eams) m	Mu Mu Mi Ma SMENT al	ck- ud arl	W GR Marg	olant Black organ Gre frag ADIN gina w ms) m	mate very ic ma y, she gment  NET S  I	rial fine atter ell ts 100 lov sta	<b>EAN</b> % fo	MS radien	F	Poor eams ack o	)	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Paral 1. Epifaul Substrat	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur	er than gradie strate fa	50% ent str avora onizat	eams ble fo	### HAA	5 0 30-509 gradie stable	Subon for long the street of t	Optimow eams) mat; well-stization	Mu Mi	ck- ud arl	W GR Mary % for low not streat habitats billity les	olant Black organ Gre frac ADIN gina w ms) m ; habit ss thar	mate very ic ma y, she gment  NET S I	rial fine titter ell ss 100 low sta hal	<b>EAN</b> % fo v gra able I	r adier habit is of	<b>F</b> int str  tat; li	eams ack o	))	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish company to the company	er than gradie strate fa nal colo ver; mi	50% ent streavora onizatix of s	eams ble fo	### HA	30-509 gradie stable for full potent	Subo % for long the street of	Optimow eams) m at; well-s ization equate	Mu Mi	ck- ud arl 10-30° gradie stable availal desira	W GR Marg % for low nt streat habitat; billity less ble; sub	Black brgan Gre frag  ADIN w ms) m ; habit	mate very nic ma y, she gment NET S I	rial fine utter ell ts 100 lov sta hal	<b>EAN</b> % fo v gra able I bitat	r adier habit is of	<b>F</b> int str  tat; li	Poor eams ack o	))	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur	er than gradie strate fa nal colo ver; mi	50% ent stravora conizationization of s ogs, u	reams uble for tion & snags underco	HA HA  HA  Cut	5 5 0 30-509 gradie stable for full potent for ma	Subo % for long that stree habitate colonicial; ad intena	Optimow eams) mat; well-stization	Mu Mi Mi SMENT al	ck- ud arl 10-30° gradie stable availal desira	W GR Mary % for low not streat habitat; billity less ble; sub	Black brgan Gre frag  ADIN w ms) m ; habit	mate very nic ma y, she gment NET S I	rial fine utter ell ts 100 lov sta hal	<b>EAN</b> % fo v gra able I	r adier habit is of	<b>F</b> int str  tat; li	eams ack o	))	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O" 5"  Greate for low of subs epifaur fish cor subme	er than gradie strate fa nal colo ver; mi rged lo cobble	50% ent str avora onizat ix of s ogs, u	reams able for tion & snags andero ther	HA HA  HA  HA	30-50% gradie stable for full potent for ma popula	Subo % for longer habitant colonicial; addintenant attions;	Optimow eams) mat; well-sization equate	Mu Mi	ck- ud arl  10-30 gradie stable availal desira freque	W GR Mary % for low not streat habitat; billity less ble; sub	Black brgan Gre frag  ADIN w ms) m ; habit	mate very nic ma y, she gment NET S I	rial fine utter ell ts 100 lov sta hal	<b>EAN</b> % fo v gra able I bitat	r adier habit is of	<b>F</b> int str  tat; li	eams ack o	))	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish cor subme banks,	er than gradie strate fa nal colo ver; mi rged lo cobble	50% ent strandarder favorationizationizationizationi favorationiz	reams tion & nags ndero ther stage	55.44  HA  ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	30-50% gradie stable for full potent for ma popula additio	Subo % for longer to the formula of	Optimow eams) mat; well-sization equate ince of	Mu Mu Ma	ck- ud arl  10-30 gradie stable availal desira freque	W GR Mary % for low not streat habitat; billity less ble; sub	Black brgan Gre frag  ADIN w ms) m ; habit	mate very nic ma y, she gment NET S I	rial fine utter ell ts 100 lov sta hal	<b>EAN</b> % fo v gra able I bitat	r adier habit is of	<b>F</b> int str  tat; li	eams ack o	))	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable	er than gradie strate fa nal colo ver; mi rged lo cobble habitat	50% ent strandard strandar	reams able for tion & snags andero ther stage	HA HA	30-50% gradie stable for full potent for ma popula additio	Subont street habitations; and subont street to the	Optimow eams) m at; well-s ization equate ince of present abstrate fall, but	Mu Mu Ma	ck- ud arl  10-30 gradie stable availal desira freque	W GR Mary % for low not streat habitat; billity less ble; sub	Black brgan Gre frag  ADIN w ms) m ; habit	mate very nic ma y, she gment NET S I	rial fine utter ell ts 100 lov sta hal	<b>EAN</b> % fo v gra able I bitat	r adier habit is of	<b>F</b> int str  tat; li	eams ack o	))	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allov	er than gradie strate fi nal colo ver; mi rged lo cobble habitat w full co	50% ent strander favorationization ix of stogs, under or of t & at olonization, logs/	reams able for tion & ther stage tation stage zation	HA HA	30-509 gradie stable for full potent for ma popula additio form o	% for long the street of the s	Optimow eams) m at; well-s ization equate ince of present abstrate fall, but	Mu Mu Ma	ck- ud arl  10-30 gradie stable availal desira freque	W GR Mary % for low not streat habitat; billity less ble; sub	Black brgan Gre frag  ADIN w ms) m ; habit	mate very nic ma y, she gment NET S I	rial fine utter ell ts 100 lov sta hal	<b>EAN</b> % fo v gra able I bitat	r adier habit is of	<b>F</b> int str  tat; li	eams ack o	))	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Para  1. Epifaul Substrat Available Cover	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal e/	Greate for low of subsepifaur fish consubanks, stable to allow potenti	er than gradie strate fa cold ver; mi crobble cobble habitat w full cold in e., e not n	50% ent str favora onizat ix of s ogs, u e or of t & at oloniz , logs/ new fa	reams able for tion & ther stage tation stage zation	HA HA HA	30-509 gradie stable for full potent for ma popula additio form o	Subo for leading to the street of the stree	Optimow eams) mat; well-sization equate ince of present abstrate fall, but if	Mu Mu Ma	ck- ud arl  10-30 gradie stable availal desira freque	W GR Mary % for low not streat habitat; billity less ble; sub	Black brgan Gre frag  ADIN w ms) m ; habit	mate very nic ma y, she gment NET S I	fine atter ell es	<b>EAN</b> % fo v gra able I bitat	r adier habit is of	<b>F</b> int str  tat; li	eams ack o	))	each	
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti that are not trai	er than gradie strate fall color ver; mi crobble habitat w full color al (i.e., e not nesient)	50% ent str avora onizat ix of s ogs, u e or o t & at oloniz , logs/	reams able for tion & ther stage tation stage zation	HA HA HA	30-509 gradie stable for full potent for ma popula additio form o yet pre coloniz high el	Subo for leading to the street of the stree	ow trans) mat; well-sization equate ince of presentials, but if for (may rascale).	Mu Mu Ma	ck- ud arl  10-30 gradie stable availal desira freque remov	W GR Mary % for low not streat habitat; billity less ble; sub	Black brgan Gre frag  ADIN w ms) m ; habit	mate very nic ma y, she gment NET S I	rial fine utter ell ts 100 lov sta hal	<b>EAN</b> % fo v gra able I bitat	r adier habiti is ol	<b>F</b> int str  tat; li	eams ack o	))		

0 Dasi								
2. Pool	Mixture of substrate	Hardpan clay of bedrock: no						
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.				
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged					
	mats and submerged	and submerged	vegetation.					
	vegetation common.	vegetation present.						
Score 6				<u>'n n n n n n</u>				
	20 19 18 17 16	15 14 13 12 11		6 5 4 3 2 1 0				
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small				
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.				
	small-deep pools present.	few shallow	pools.	shallow or pools absent.				
Score 6				<del>'</del>				
Score 0	20 19 18 17 16	15 14 13 12 11		6 5 4 3 2 1 0				
	20 19 16 17 10	15 14 15 12 11	10 9 6 7	0 3 4 3 2 1 0 I				
4.Sediment	Little or no enlargement	Some new increase in	Heavy deposits of fine					
Deposition	of islands or point bars	bar formation, mostly	new gravel, sand or fine	material, increased bar				
	and less than <20% of	from gravel, sand or fine	sediment on old and new	material, increased bar development; more than				
	the bottom affected by	sediment; 20-50% of the	bars; 50-80% of the	development; more than 80% of the bottom				
	sediment deposition.	bottom affected; slight	bottom affected; sediment	changing frequently; pools				
	'	deposition in pools.	deposits at obstructions,	almost absent due to				
			constrictions, and bends;	substantial sediment				
			moderate deposition of	deposition.				
			pools prevalent.	deposition.				
Score 15	<del>                                     </del>			<del>'</del>				
3001e   13	20 19 18 17 16		10 9 8 7	6 5 4 3 2 1 0				
5. Channel Flow	Water reaches base of	Water fills >75% of the	Water fills 25-75% of the	Very little water in				
Status	both lower banks, and	available channel; or	available channel, and/or	channel and mostly				
	mimimal amount of	<25% of channel	riffle substrates are	present as standing pools.				
	Thirminal amount of			present as standing pools.				
	channel substrate is	substrate is exposed.	mostly exposed.					
		substrate is exposed.	mostly exposed.					
Score 11	channel substrate is	substrate is exposed.	mostly exposed.					
Score 11	channel substrate is			6 5 4 3 2 1 0				
	channel substrate is exposed.  20 19 18 17 16	15 14 13 12 11	10 9 8 7					
6. Channel	channel substrate is exposed.  20 19 18 17 16  Channelization or	15 14 13 12 11 Some channelization	10 9 8 7 Channelization may be	Banks shored with gabion				
	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or	15 14 13 12 11  Some channelization present, usually in areas	10 9 8 7  Channelization may be extensive; embankments	Banks shored with gabion or cement; over 80% of				
6. Channel	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream	15 14 13 12 11  Some channelization present, usually in areas of bridge abutments;	10 9 8 7  Channelization may be extensive; embankments or shoring structures	Banks shored with gabion or cement; over 80% of the stream reach				
6. Channel	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	To the first series of bridge abutments;	10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks;	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted.				
6. Channel	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream	To the state of th	10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly				
6. Channel	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than	10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed				
6. Channel	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be	10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly				
6. Channel	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent	10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed				
6. Channel	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be	10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed				
6. Channel Alteration	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent	10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed				
6. Channel	channel substrate is exposed.  20 19 18 17 16  Channelization or dredging absent or minimal; stream with normal	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	10 9 8 7  Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed				

7. Channel		The bends in t	the strean	n	The bends i	in the str	eam	The bends i	n the strea	am	Channel stra	ight;	
Sinuosity		increase the s	tream		increase the	e stream		increase the	stream		waterway ha	s been	
		length 3 to 4 ti	imes long	er	length 2 to 3	3 times l	onger	length 1 to 2	times Ion	ger	channelized	for a long	g
		than if it was in	n a straigl	nt	than if it wa	s in a str	aight	than if it was	s in a strai	ght	distance.		
		line. (Note - ch	nannel		line.			line.					
		braiding is cor	nsidered										
		coastal plains		r									
		normal low-lyin											
		this parameter	Ū										
		easily rated in											
		areas.)											
Score 6			7 🗖	П		пг				1 🔽			$\neg$ $\neg$
00010		20 19 1	8 17	<u>1</u> 6	15 14	13	<u> </u>	. 10	<u> </u>	<u>. ⊻</u> 7	6 5 4	<u> </u>	2 1
		20 13 1	.0 17	10	13 14	13	12 11	. 10 .			U J 4		2 1
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable; 3	30-	Unstable; ma	any erod	ed areas;
(score each ban	k)	of erosion or b	ank failur	e	infrequent,	small are	eas of	60% of bank	k in reach	has	"raw" areas	frequently	y along
Note: determine left	or	absent or mini	imal; little		erosion mos	stly heal	ed	areas of ero	sion; high		straight sect	ions and	bends;
right side by facing		potential for fu	ıture		over. 5-30%	6 of bank	c in	erosion pote	ential durin	g	obvious ban	k sloughi	ng;
downstream.		problems. <5%	% of bank		reach has a	reas of		floods.		_	60-100% of	bank has	
		affected.			erosion.						erosional sc	ars.	
Score (LB)	5			П		П		<u> </u>		П		П	
, , ,		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	5		$\overline{\Box}$	$\overline{\Box}$	$\overline{}$	П	$\overline{\Box}$	$\overline{\mathbf{V}}$		П	$\Box$	$\Box$	$\Box$
(112)		Right Bank	10	9	<u> </u>	7	<u> </u>	<u> </u>	<u> </u>	3		1	
		g zu						Π	•		<u> </u>		
9. Vegetative		More than 90%	% of the		70-90% of t	he strea	m-	50-70% of tl	ne stream-	-	Less than 50	% of the	
Protection (sco	ore	streambank su	urfaces ar	nd	-bank surfa	ces cove	ered	bank surfac	es covered	t	streambank	surfaces	
each bank)		immediate ripa	arian zone	es	by native ve	egetation	, but	by vegetation	n; disrupti	on	covered by v	egetation	n;
Note: determine left	or	covered by na	itive		one class o	f plants i	s not	obvious; pat	ches of ba	are	disruption of	streamb	ank
right side by facing		vegetation, inc	cluding		not well rep	resented	ł	soil or close	ly cropped	I	vegetation is	very hig	h;
downstream.		trees, underst	ory shrub	s,	disruption e			vegetation of	common; le	ess	vegetation h	as been	
		or nonwoody	•		affecting ful			than one-ha	If of the		removed to		
		macrophytes;	vegetativ	е	potential to			potential pla			5 centimeter	s or less	in
		disruption thro	Ū	•	extent; more			height rema			average stub		
		grazing or mo			half of the p			Incignit rema	iiiiig.		average stur	ble rieig	
		-	•		-								
		minimal or not	-		stubble heig	gni rema	iriirig.						
		almost all plan		a									
0 (1.5)	_	to grow natura	ally.		L			<u> </u>					
Score (LB)	5	. 6. – 1		Ť	<u> </u>	ᆚ	Ц	<u> </u>	<u> </u>	Ц_		Ц_	Ш
O (DD)		Left Bank	10	9	8	7_	6	5	4	3	2	1_	_
Score (RB)	7	01 1 1 0 1	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>ц</u>	<u> </u>	Ц_	Ш
		Right Bank	10	9	8	7	6	5 I	4	3	2	1	
10. Riparian		Width of ripari	an zone		Width of rip	arian zoi	ne 12-	Width of ripa	arian zone	6-	Width of ripa	ırian zone	e <6
Vegstative Zor	ne .	>18 meters; h			18 meters;			12 meters; h			meters: little		
Width (score ea							atad			- d			
· ·	acii	activities (i.e.,	-		activities ha			activities ha		<del>s</del> u	vegetation d	ue to nui	IIaII
bank riparian		lots, roadbeds			zone only m	nınımally		zone a grea	t deal.		activities.		
zone)		cuts, lawns, or	r crops)										
		have not impa	cted zone	€.									
Score (LB)	3									$\checkmark$			
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	5							<b>▽</b>					
		Right Bank	10	9	8	7	6	5	4	3	2	1	
TOTAL SCORE	96												

Project ID:	Somerville	South An	nendm	ent 2	Stı	ream	Class	:	Ephe	emeral			
Stream ID:	#13B				Lo	catio	n:		Mack	cey, IN			
Lat:	38.23262	Long:		-87.34606	Riv	ver B	asin:		Ohio	1			
Investigators:	Will												
Cianatura				Date:	;	5-May	/-2011		Reas	on for Surve	y:		
Signature:				Time:			2:1	6 PM	404 F	unctional As	ssess	ment	
WEATHER		Current			Past 2	24-Hc	urs			Heavy rain i	n last	7-days	S
CONDITIONS		Storm (He	eavy Rain	1)	Sto	rm (He	avy Rair	1)		□ NO [	<b>✓</b> Yes		
		Rain Stea	dy		Rair	n Stead	ly			Air Temp °C	;	1	8
		Showers	(Intermitt	tent)	Sho	wers (I	Intermit	tent)		Air Temp °F		6	5
		Cloud Cov	/er %		✓ Clou	ud Cove	er %		90	Other:	•		
		✓ Clear/Sun	ny		Clea	ar/Sunr	าง						
	221/2442	0 14											
SITE LOCATION	ON/MAP	See Atta	cnmen	t									
STREAM		Stream Su	ubsvste	em					Strea	am Type			
CHARACTER	IZATION	Perennial		ntermittent	✓E	phemer	al			ldwater			
			_							armwater			
		Stream O	rain							Catchn	nent A	rea	
		Upland R	_	Ī✓	Mixture	of Orig	iins			Mile <sup>2</sup>		0.0	02
		Spring-fee			Wetland	•	Other			Km²		0.	.1
WATERSHED		Surroundi	ing Lar			_		Local	Wate	ershed NPS I			
FEATURES		✓ Forest		<b>5%</b> 🔲 co		al		☐ No					
		Field/Past		☐ Ot	ther					ources Ag. in		d sedir	nent
		✓ Agricultur	e :	95%			_	Local	Wate	ershed Erosi	on		
		Residentia	al					Nor	ne 🔽	' Moderate	Heavy		
RIPARIAN		Indicate th	ne dom	inant typ	e and	redor	d the	domin	ant s	species prese	ent		
VEGETATION		✓ Trees				Herbs		None		poolee proc			
(18 meter buff		Dominant	_			•	_						
,	· · · ·		-				<u></u>						
INSTREAM		Est. Reach			ft	465	m	142		Canopy Cov	er er		
FEATURES		Est. Strear			ft		m	0.0		Open	Par	tly Open	
		Sampling I			ft <sup>2</sup>	0	m <sup>2</sup>	0		Shaded	<b>✓</b> Par	tly Shade	edC
		Sampling /		ile²	mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0					
		Area in km	ı²		mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water Ma	ark	ft	0.00
		Est. Water	Depth		in	1.0	m	0.0		High Water Ma	ark	m	0.00
		Surface Ve	elocity		ft/s	0.5	m/s	0.2		% of Stream M	/lorpho	logy	
									Rif	fle %	Run '	%	
		Channelize	_		0				Po	ol %	Glide	Pool	
		Dam Prese	ent 🔲	∕es ✓ N	0				Ste	ep Pool Series			
LARGE WOOD	Y	LWD 0	.0 r	m²	0	ft <sup>2</sup>							
DEBRIS													
		Density of	LWD	m²/k	m <sup>2</sup>	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	0.0	000000	0000

AQUATIO	C		Indicate th	he don	ninant type	and re	cord th	ne don	ninant species p	resent		
VEGETA	TION		Rooted E	mergen	t Roo	ted Subm	ergent		Rooted Floating	✓ None	e	
			Free Floa	ating	Atta	iched Alg	ae		Floating Algae			
			Portion of	the re	ach with a	auatic y	retenev	tion nr	resent		0 %	
			r ortion or	1110 10	acii wilii a			iloii pi	esent		0 /8	
WATER	QUALITY		Temperat		<b>17</b> °C	63	°F	1	er Odors			
			Conductiv	•	µs/cm		332	✓N	ormal/None S	Sewage	Petroleum	
			Total Diss	_	Solids	237	mg/l	С	hemical	Anaerobic		
			pH <b>7.8</b>	1								
			Turbidity					Wat	er Surface Oils			
			✓ Clear	□si	ight Turbid	□Tur	bid	П	Slick Sheen	Globs	Flecks	
			Opague		ained	Oth			 Other	_	_	
SEDIMEN	NIT!		Odors						Danasita			
SUBSTR			✓ Normal	ı	Пс		etroleum		<b>Deposits</b> ☐ Sludge ☐ Sar	wdust F	Danar fibor	Sand
SUBSIK	AIE		Chemic		Sewage Anaerobio	_				wdust <u> </u>		Sariu
			Other	cai	Anaerobio		ione		Relic Shells L	_ Other		
			☐ Otner						Looking at stor	ae whic	h are not deen	dy
			Oils						embedded, are		-	-
			✓ Absent	Пя	light 🔲 I	Moderate	Пр	Profuse			□ No	0101 :
IN	IORGANIC	SUBS				Moderate			SANIC SUBSTR			
Substrate					e inSampl	lina	Subst		Character		% Composit	
Туре			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-	ach	9	Ту		0110110101		Sampling R	
					acii			De				eacii
Bedrock				110	acii		Detr		Sticks, wood,	coarse	Jumpinig II	eacii
	>10"			- 110	acii				Sticks, wood, plant mate		Samping N	each
Bedrock	>10" 2.5 - 1				acii			itus		rial	Jumpining III	each
Bedrock Boulder		0"			10		Detr	itus ck-	plant mate	rial fine	Sampling	each
Bedrock Boulder Cobble	2.5 - 1	0" 5"		1			Detr Mu	ck- d	plant mate Black very	rial fine tter	Sampling	eacii
Bedrock Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" 5"		1	10		Detr Mu Mu	ck- d	plant mate Black very organic ma	rial fine atter	Sampling	eacii
Bedrock Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2. gritty	0" 5" y		1	10 70		Detr Mu Mu	ck- d	plant mate Black very organic ma Grey, she	rial fine atter	Sampling	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe	0" 5" y		1 7 2	10 70 20	SSESS	Detr Mu Mu Ma	ck- ud	plant mate Black very organic ma Grey, she	rial fine atter ell		eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe slick	0" 5" y	Optimal	1 7 2	10 70 20 <b>ABITAT A</b>	SSESS Optima	Mud Mu Ma Ma	ck- ud	plant mate Black very organic ma Grey, she fragment	rial fine atter ell		eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter	0" 5" y	Optimal or than 50%	1 7 2	10 70 20 <b>ABITAT A</b>	Optima	Mud Mu Ma Ma	itus ck- ud arl	plant mate Black very organic ma Grey, she fragment	rial fine atter ell	//S Poor	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	0" 5" y	•	1 7 2 H/	10 70 20 <b>ABITAT A</b>	Optima low	Mu Mu Ma Ma MENT	ck- ud arl - LOV	plant mate Black very organic ma Grey, she fragment W GRADINET S Marginal	rial fine atter ell ss	//S Poor	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	0" 5" y Greate	er than 50%	H/	10 70 20 <b>ABITAT A</b> Sub	Optima low eams) mi	Muc Muc Mass	ck- ud arl - LOV 10-30% gradiel	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal	rial fine atter ell ts  STREAN 10% for low gra	//S Poor	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Parai  1. Epifaui Substrat	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	0" 5"  Greate for low of subs	er than 50% gradient stre	HA eams)  ble for	ABITAT A Sub 30-50% for gradient stre	Optima low eams) mi at; well-si	Muc Muc Mass	ck- ud arl - LO\ 10-30% gradier stable	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal  for low ht streams) mix of	rial fine atter ell ts  STREAN 10% for low gra stable h	Poor r dient streams)	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Greate for low of subs epifaur	er than 50% gradient stre strate favorab	HA eams) ple for on &	ABITAT A Sub 30-50% for gradient strestable habita	low eams) minat; well-senization	Mu Ma	ck- ud arl  - LOV  10-30% gradiel stable availab	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal  for low ht streams) mix of habitat; habitat	rial fine atter ell ts  STREAN 10% for low gra stable h habitat	Poor r dient streams) habitat; lack of	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Greate for low of subs epifaur fish co	er than 50% gradient stre strate favorab	HA eams) ole for on & nags,	ABITAT A Sub 30-50% for gradient strestable habite for full colon	low eams) minat; well-sinization dequate h	Mu Ma	ck- ud arl  10-309 gradier stable availab desirat	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal for low and streams) mix of habitat; habitat bility less than	rial fine atter ell ts  STREAN 10% for low gra stable h habitat	Poor r dient streams) habitat; lack of is obvious; tte unstable or	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O" 5"  Greate for low of subs epifaur fish cor subme	er than 50% gradient stre strate favorab nal colonizatio ver; mix of sn	HA eams) ole for on & nags, ndercut	ABITAT A Sub 30-50% for gradient strestable habitator full color potential; ac for maintena populations;	low eams) minat; well-senization dequate hance of	Mu Ma	ck- ud arl  10-309 gradier stable availab desirat	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	rial fine atter ell ss  TREAN 10% for low gra stable r habitat substra	Poor r dient streams) habitat; lack of is obvious; tte unstable or	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable	er than 50% gradient stre strate favorab nal colonizatio ver; mix of sn rged logs, un cobble or oth	HA eams) ble for on & hags, hdercut her	ABITAT A Sub 30-50% for gradient strestable habitator full color potential; ac for maintena	low eams) minat; well-senization dequate hance of	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	rial fine atter ell ss  TREAN 10% for low gra stable r habitat substra	Poor r dient streams) habitat; lack of is obvious; tte unstable or	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allov	er than 50% gradient stre strate favorab nal colonizatio ver; mix of sn rged logs, un cobble or oth habitat & at s v full coloniza	H/A eams) ole for on & nags, ndercut ther stage	ABITAT A Sub 30-50% for gradient strestable habite for full colon potential; ac for maintena populations; additional su form of new	low eams) minute and its well-se inization dequate hance of the presence of th	Muc Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	rial fine atter ell ss  TREAN 10% for low gra stable r habitat substra	Poor r dient streams) habitat; lack of is obvious; tte unstable or	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti	er than 50% gradient stre strate favorab hal colonizatio ver; mix of sn rged logs, un cobble or oth habitat & at s v full colonizatio ial (i.e., logs/s	HA eams) ble for on & hags, hadercut her stage ation snags	ABITAT A Sub 30-50% for gradient strestable habite for full colon potential; ac for maintena populations; additional strestable form of new yet prepared	low eams) minat; well-sinization dequate hance of presence ubstrate if	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	rial fine atter ell ss  TREAN 10% for low gra stable r habitat substra	Poor r dient streams) habitat; lack of is obvious; tte unstable or	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Greate for low of subs epifaur fish co subme banks, stable to allov potenti that are	er than 50% gradient stre strate favorab nal colonizatio ver; mix of sn rged logs, un cobble or oth habitat & at s w full coloniza ial (i.e., logs/s e not new fall	HA eams) ble for on & hags, hadercut her stage ation snags	ABITAT A Sub 30-50% for gradient strestable habite for full color potential; ac for maintena populations; additional strestable form of new yet prepared colonization	low eams) minute and the second secon	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	rial fine atter ell ss  TREAN 10% for low gra stable r habitat substra	Poor r dient streams) habitat; lack of is obvious; tte unstable or	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Parai 1. Epifaur Substrat Available Cover	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal e/	O"  5"  Greate for low of subs epifaur fish co subme banks, stable to allov potenti that are	er than 50% gradient stre strate favorab hal colonizatio ver; mix of sn rged logs, un cobble or oth habitat & at s v full colonizatio ial (i.e., logs/s	HA eams) ble for on & hags, hadercut her stage ation snags	ABITAT A Sub 30-50% for gradient strestable habite for full colon potential; ac for maintena populations; additional strestable form of new yet prepared	low eams) minute and the second secon	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal 6 for low nt streams) mix of habitat; habitat bility less than ble; substrate ntly disturbed or ed.	rial fine atter ell ts  TREAN  10% for low gra stable r habitat substra lacking.	Poor r dient streams) habitat; lack of is obvious; tte unstable or	eacii
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti that are not trai	gradient strestrate favorable al colonization ver; mix of snarged logs, un cobble or oth habitat & at so w full colonization (i.e., logs/se not new fall ensient).	HA eams) ble for on & hags, hadercut her stage ation snags	ABITAT A Sub 30-50% for gradient strestable habite for full colon potential; according additional strestable form of new yet prepared colonization high end of	low eams) minute at; well-sinization dequate hance of presence pubstrate i fall, but no d for (may rate scale).	Mu Ma Ma Ma Ma Ma Me MeNT Mal Mal Ma Ma MeNT Mal Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-309 gradier stable availab desirat frequer remove	plant mate Black very organic ma Grey, she fragment  W GRADINET S  Marginal  for low nt streams) mix of habitat; habitat bility less than ble; substrate ntly disturbed or ed.	rial fine atter ell ss  TREAN 10% for low gra stable r habitat substra	Poor r dient streams) habitat; lack of is obvious; te unstable or	1 (

	Ī	1						
2. Pool	Mixture of substrate	Hardpan clay of bedrock: no						
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.				
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged					
	mats and submerged	and submerged	vegetation.					
	vegetation common.	vegetation present.						
Score 6				<del>'</del>				
00010   0	20 19 18 17 16	5 15 14 13 12 11		6 5 4 3 2 1 0				
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small				
3. I doi variability	_	large deep; very	·	' ' '				
	large-deep, smallshallow,		more prevalent than deep	shallow or pools absent.				
Score 5	small-deep pools present.	few shallow	pools.	<del>                                     </del>				
Score 5		. 15 14 12 12 14						
	20 19 18 17 16	5 15 14 13 12 11 T	10 9 8 7	6 5 4 3 2 1 0				
4.Sediment	Little or no enlargement	Some new increase in	Moderate deposition of	Heavy deposits of fine				
Deposition	of islands or point bars	bar formation, mostly	new gravel, sand or fine	Heavy deposits of fine material, increased bar				
	and less than <20% of	from gravel, sand or fine	sediment on old and new	development: more than				
	the bottom affected by	sediment; 20-50% of the	bars; 50-80% of the	development; more than 80% of the bottom				
	sediment deposition.	bottom affected; slight	bottom affected; sediment					
	dediment deposition.	deposition in pools.	deposits at obstructions,	t changing frequently; pools almost absent due to				
		deposition in pools.	·					
			constrictions, and bends;	substantial sediment				
			moderate deposition of	deposition.				
0 14	<del> </del>		pools prevalent.					
Score 14								
	20 19 18 17 16	5 15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
5. Channel Flow	Water reaches base of	Water fills >75% of the	Water fills 25-75% of the	Very little water in				
Status	both lower banks, and	available channel; or	available channel, and/or	channel and mostly				
	mimimal amount of	<25% of channel	riffle substrates are	present as standing pools.				
	channel substrate is	substrate is exposed.	mostly exposed.	process as starraing posits.				
	exposed.	Substrate is exposed.	mostry exposed.					
Score		<del></del>		<del>'</del>				
7	20 19 18 17 16	5 15 14 13 12 11		6 5 4 3 2 1 0				
6. Channel	Channelization or	Some channelization	Channelization may be	Banks shored with gabion				
Alteration	dredging absent or	present, usually in areas	extensive; embankments	or cement; over 80% of				
	minimal; stream	of bridge abutments;	or shoring structures	the stream reach				
		evidence of past	, and the second					
	lwith normal			channelized and disrupted.				
1	with normal	'	present on both banks;	'				
	pattern.	channelization, i.e.,	and 40 to 80% of stream	Instream habitat greatly				
		channelization, i.e., dredging, (greater than	and 40 to 80% of stream reach channelized and	Instream habitat greatly altered or removed				
		channelization, i.e., dredging, (greater than past 20 yr) may be	and 40 to 80% of stream	Instream habitat greatly				
		channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent	and 40 to 80% of stream reach channelized and	Instream habitat greatly altered or removed				
		channelization, i.e., dredging, (greater than past 20 yr) may be	and 40 to 80% of stream reach channelized and	Instream habitat greatly altered or removed				
	pattern.	channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent	and 40 to 80% of stream reach channelized and	Instream habitat greatly altered or removed				
Score 18		channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	and 40 to 80% of stream reach channelized and disrupted.	Instream habitat greatly altered or removed				

7 Observal				<b>—</b>			T						
7. Channel		The bends in	the stream	The be	ends in th	ne stream	The bends	in the s	stream	Channel stra	aight;		
Sinuosity		increase the s	tream	increa	se the sti	ream	increase th	ne strea	m	waterway ha	as been		
		length 3 to 4 to	mes longe	r length	2 to 3 tin	nes longer	length 1 to	2 times	longer	channelized	for a long	g	
		than if it was i	n a straight	than if	it was in	a straight	than if it w	as in a s	straight	distance.			
		line. (Note - cl	•	line.		Ü	line.		-				
		braiding is cor											
		coastal plains											
		normal low-lyi	ng areas.										
		this paramete	r is not										
		easily rated in	these										
		areas.)											
Score	6		1 [	7 7	ПГ	1		1 [		п п	пп		
I		20 19 1	.8 17	16 15	14 1	13 12 1	1 10	9 8		6 5 4	3	2 1	
		20 13 1	.0 17	10 15		15 12 1	1		, ,	<u> </u>			
8. Bank Stabil	ity	Banks stable;	evidence	Moder	ately stal	ble;	Moderatel	y unstab	ole; 30-	Unstable; m	any erod	ed areas;	
(score each bai	nk)	of erosion or b	ank failure	infrequ	ient, sma	all areas of	60% of ba	nk in rea	ach has	"raw" areas	frequently	y along	
Note: determine lef	•	absent or min		·	n mostly		areas of e	rosion: h	niah		•	, ,	
		potential for fu	,		5-30% of		erosion po	,	J	straight sections and bends; obvious bank sloughing:			
right side by facing		'						renda 0	uning	obvious bank sloughing; 60-100% of bank has			
downstream.		problems. <5%	₀ of bank		has area	S OI	floods.					5	
		affected.		erosio	n.					erosional sc	ars.		
Score (LB)	6												
		Left Bank	10	9 8		7 6	5	4	3	2	1		
Score (RB)	6		ПГ			] 🔽		П		П			
,		Right Bank	10	9 8		<del></del>	<u></u>	4	3		1		
		Mg/It barik	10	<del>, , ,</del>			1	•		1			
9. Vegetative		More than 909	% of the	70-90°	% of the	stream-	50-70% of	the stre	am-	Less than 50	0% of the	:	
Protection (sc	ore	streambank si	urfaces and	d -bank	surfaces	covered	bank surfa	ces cov	ered	streambank	surfaces		
each bank)		immediate ripa	arian zones	by nat	ive venet	ation, but	by vegetat	ion: disr	untion	covered by v	/enetatio	n·	
Note: determine lef	t or	covered by na			•	ants is not			•		•		
	t OI	,			•		obvious; p			disruption of streambank			
right side by facing		vegetation, inc	•		II represe		soil or clos		•	vegetation is		ın;	
downstream.		trees, underst	ory shrubs	disrup	tion evide	ent but not	vegetation	commo	n; less	vegetation h	as been		
		or nonwoody		affecti	ng full pla	ant growth	than one-h	alf of th	е	removed to			
		macrophytes;	vegetative	potent	ial to any	great	potential p	lant stub	oble	5 centimeter	s or less	in	
		disruption thro	ugh	extent	more th	an one-	height rem	aining.		average stul	oble heig	ht.	
		grazing or mo	ŭ	half of	the note	ntial plant		J		Ŭ	Ü		
		minimal or not	•		•	remaining.							
			,		e neigni i	emaining.							
		almost all plar											
		to grow natura	ally.										
Score (LB)	4							✓					
		Left Bank	10	9 8		7 6	5	4	3	2	1		
Score (RB)	6					] 🗸							
		Right Bank	10	9 8	7	7 6	5	4	3	2	1		
10. Riparian		Width of ripari	an zone	Width	of riparia	n zone 12-	Width of ri	parian z	one 6-	Width of ripa	arian zone	e <6	
Vegstative Zo	ne	>18 meters; h	uman	18 me	ters; hum	nan	12 meters	human		meters: little	or no rip	arian	
Width (score e	ach	activities (i.e.,	narking	activiti	es have i	impacted	activities h	ave imp	acted	vegetation d	ue to hur	man	
-	~~	·	-							_	Se to riui		
bank riparian		lots, roadbeds		zone d	only minir	nally.	zone a gre	at deal.		activities.			
zone)		cuts, lawns, o	r crops)										
		have not impa	cted zone.										
Score (LB)	2		ПГ	7 -	Г	]		П		<u> </u>	П		
( <b></b> )		Left Bank	10	<u> </u>		<u> </u>	<u></u>	4	3	<u>:-</u>	1		
Score (RB)	2	LCIT DOUR	<u> </u>	<del>, ,</del>		, <u> </u>		$\overline{}$				$\neg$	
ocore (VD)	3	Diah+ DI	<u> </u>	<u> </u>		<u>, L</u>	ᆛ		<u>√</u>	<u> </u>		Ш	
		Right Bank	TO ;	9 8		7 6	5	4	3	2	1		
TOTAL SCORE	82												

Project ID:	Somerville	South A	mendı	2	Stream Class:				Ephemeral					
Stream ID:	#13B(38)					Lo	catio	n:		Mack	cey, IN			
Lat:	38	Long:			-87	Riv	/er B	asin:		Ohio	1			
Investigators:	Josh Iddin	gs, Rajes	h Pou	del										
Ciamatura.				Dat	e:	;	5-May	y-2011	1	Reas	on for Surve	y:		
Signature:				Tim	ne:			5:5	57 PM	404 F	unctional As	ssess	ment	
	•			•					•					
WEATHER		Current				Past 2	24-Ho	ours			Heavy rain ii	n last	7-day	s
CONDITIONS		Storm (F	leavy Ra	in)		Stor	m (Hea	avy Rair	n)		□ NO [	<b>✓</b> Yes		
		Rain Ste	ady			Rair	n Stead	ly			Air Temp °C		1	8
		Showers	(Interm	ittent)		Sho	wers (I	Intermit	ttent)		Air Temp °F		6	5
		Cloud Co	over %			✓ Clou	ıd Cove	er %		90	Other:			
		✓ Clear/Su	nny			Clea	ar/Sunn	ny						
SITE LOCATION	ON/MAP	See Atta	achme	nt										
STREAM		Stream S	ubsvs	tem						Strea	am Type			
CHARACTERI	ZATION	Perennia		Interm	ittent	√Fr	hemer	·al			ldwater			
						<b>—</b> -r	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<b></b>			armwater			
		Stream C	rain							۰۰۰ ت	Catchn	nent /	∆rea	
		Upland	•		[7]	Mivtura	of Orig	iine			Mile <sup>2</sup>			01
		Spring-fe		ad wata		Mixture of Origins  Wetland  Other					Km <sup>2</sup>		_	.0
		эргінд-п	cu/ Gi oui	iu wate	·!	vvetiant	<u>' Ш</u>	Other						
WATERSHED		Surround	ding La	and u	se & F	Percen	tage		Local	Wat	ershed NPS I	Pollur	ntion	
FEATURES		Forest			Со	mmercia	I		No	eviden	ce Some	potent	ial sourc	es
		Field/Pa	sture		<b>✓</b> Otl	her		100	Op/	ious s	ources Ag. in	duce	d sedi	ment
		Agricultu	ıre		<u>Haul</u>	road		_	Local	Wat	ershed Erosi	on		
		Resident	ial						Nor	ne 🔽	' Moderate	Heavy		
RIPARIAN		Indicato	tha da	minai	at turn	o and	radar	d tha	domin	ant c	species prese	nnt		
VEGETATION		Trees			Grasse		Herbs		None	iaiit s	species prese	∌IIIL		
(18 meter buff		Dominan	_					_	ivone					
(10 meter buil	GI )	Dominan	t opec	,ics.	reie	ııınaı ç	jiass							
INSTREAM		Est. Read	h Lenç	gth		ft		m	0		<b>Canopy Cov</b>	er		
FEATURES		Est. Strea	am Wic	lth		ft		m	0.0		<b>✓</b> Open	Par	rtly Open	1
		Sampling				ft <sup>2</sup>	0	$m^2$	0		Shaded	Par	rtly Shad	edC
		Sampling	Area r	nile <sup>2</sup>		mile <sup>2</sup>	0.0	$km^2$	0.0					
		Area in kr	$n^2$			mile <sup>2</sup>	0.0	$km^2$	0.0		High Water Ma	ark	ft	0.00
		Est. Wate	r Dept	h		in		m	0.0		High Water Ma	ark	m	0.00
		Surface V	elocity/	,		ft/s	n/a	m/s	####		% of Stream M	1orpho	logy	
										Rif	fle %	Run	%	
		Channeliz	zed 🔽	Yes	☐ No	)				Po	ol %	Glide	Pool	
		Dam Pres		•	✓ No						ep Pool Series			
LABOE WOOD	·	1.14/5		m <sup>2</sup>		^	ft <sup>2</sup>			•				
LARGE WOOD	T	LWD	0.0	- ""		0 1	ıı							
DEBRIS		Dan - 14-	£   \4/=		2,,	2	0.00	10000	0000		£42/:1 - 2	0.0	00000	2000
I		Density of	ot LVVL	,	m <sup>2</sup> /kı	m	U.UU	00000	UUUU		ft <sup>2</sup> /mile <sup>2</sup>	U.U	000000	JUUU

AQUATIO				ninant type and re					
VEGETA	TION		Rooted Emergent		•		_	✓ None	Э
			Free Floating	Attached Alga	ae	L	Floating Algae		
			Portion of the re	ach with aquatic	vegetat	tion pr	esent		0 %
	QUALITY Vater Pres	ent	Temperature Conductivity Total Dissolved pH	#### °C n/a µs/cm	°F mg/l	□N	er Odors  ormal/None Section An	wage aerobic	Petroleum
				ight Turbid ☐ Tur			er Surface Oils Slick Sheen D	Globs	Flecks
SEDIMEN SUBSTR			Odors  Normal Chemical Other	Sewage Police N	etroleum Ione			Other	
			Oils		_		·	undersi	ides black in color?
				light Moderate	- P	Profuse	Yes		No
		SUBS	STRATE COMPO				SANIC SUBSTRA		T
Substrate	Diame	ter	-	e inSampling	Subst		Characteris	tic	% Composition in
Type			Re	each	Typ		<u> </u>		Sampling Reach
Bedrock	- 10"				Detr		Sticks, wood, co		Sampling Reach
Bedrock Boulder	>10"		1	10	Detr	itus	plant materi	al	Sampling Reach
Bedrock Boulder Cobble	2.5 - 1	0"	1	10 10	Detr Mud	itus ck-	plant materi Black very fi	al ne	Sampling Reach
Bedrock Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" .5"	1 1	10 10 50	Detr Mud Mu	itus ck- ud	plant materi Black very fii organic matt	al ne er	Sampling Reach
Bedrock Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2 gritty	0" .5"	1 1	10 10	Detr Mud	itus ck- ud	plant materi Black very fii organic matt Grey, shell	al ne er	Sampling Reach
Bedrock Boulder Cobble Gravel Sand Silt	2.5 - 1 0.1 - 2.	0" .5" ,	1 1	10 10 50	Detr Mud Mu	itus ck- ud	plant materi Black very fii organic matt	al ne er	Sampling Reach
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick	0" .5" ,	1 5	10 10 50 30	Detr Mud Mu Ma	ck- ud	plant materi Black very fir organic matt Grey, shell fragments	al ne er I	
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick	0" .5" ,	1 1 5 3	10 10 50 30 ABITAT ASSESS	Mud Mu Ma Ma	ck- ud	plant materi Black very fii organic matt Grey, shell fragments	al ne er I	18
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Para	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter	0" .5" y	1 5	10 10 50 30	Mud Mud Ma Ma MENT	itus ck- ud arl	plant materi Black very fir organic matt Grey, shell fragments W GRADINET ST Marginal	al ne er I	IS Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" .5" y	HAOptimal er than 50%	10 10 50 30 ABITAT ASSESS	Mud Mu Ma Ma MENT	ck- ud arl - LOV	plant materi Black very fii organic matt Grey, shell fragments	al ne er l	1S Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parai	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" yy	HA Optimal	ABITAT ASSESS SubOptima 30-50% for low	Mu Ma	ck- ud arl - LOV 10-30% gradiei	plant materi Black very fii organic matt Grey, sheli fragments  W GRADINET ST Marginal	al ne er l TREAM 10% for low grad	IS Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Parai  1. Epifaui Substrat	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O" 5" y  Greate for low of subs	HA Optimal er than 50% gradient streams)	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix	Mud Mud Ma	ck- ud arl - LO\ 10-309 gradier stable	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low and streams) mix of	al ne er l 10% for low grad stable h	Poor dient streams)
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  y  Greate for low of subsepifaur	HA Optimal er than 50% gradient streams) strate favorable for	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mitstable habitat; well-su	Mu Ma	ck- ud arl  - LOV  10-30% gradier stable availab	plant materi Black very fii organic matt Grey, sheli fragments  W GRADINET ST Marginal for low ht streams) mix of habitat; habitat	REAM  10% for low grad stable habitat	Poor dient streams) habitat; lack of
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subsepifaun fish co	HA Optimal er than 50% gradient streams) strate favorable for hal colonization &	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-st	Muc Mu Ma Ma Ma Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-309 gradier stable availab desirat	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than	REAM  10% for low grad stable habitat	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subsepifaur fish co subme	HA Optimal er than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags,	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-st for full colonization potential; adequate h	Muc Mu Ma	ck- ud arl  10-309 gradier stable availab desirat	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subsepifaul fish co subme banks,	HAOptimal er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, orged logs, undercut	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of	Mu Ma Ma Ma Me	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subsepifaus fish co subme banks, stable	HA Optimal er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, erged logs, undercut cobble or other	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence	Muc Mu Ma	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish co subme banks, stable to allow potenti	HA Optimal er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, gred logs, undercut cobble or other habitat & at stage w full colonization ial (i.e., logs/snags	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for	Mu Ma Ma Ma Me	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish co subme banks, stable to allow potenti that ar	H/Optimal er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, erged logs, undercut cobble or other habitat & at stage w full colonization ial (i.e., logs/snags e not new fall and	ABITAT ASSESS SubOptima 30-50% for low gradient streams) min stable habitat; well-so for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for colonization (may rat	Mu Ma Ma Ma Me	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish co subme banks, stable to allow potenti that ar	HA Optimal er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, gred logs, undercut cobble or other habitat & at stage w full colonization ial (i.e., logs/snags	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for	Mu Ma Ma Ma Me	ck- ud arl  10-30% gradier stable availab desirat frequen	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grad stable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or

20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  3. Pool Variability Even mix of largeshallow, small-deep, smallshallow, small-deep, pools present.  Score 1									
Characterization firm sand prevalent; root mats and submoraged vegetation common.  Score 6	2. Pool	Mixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no				
mats and submerged vegetation common.  Score 6  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  3. Pool Variability Even mix of largeshallow, small-deep pools present.  Score 1  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  4. Sediment Deposition of islands or point bars and less than <20% of the bottom affected by sediment deposition.  Bedient deposition in pools.  Score 16  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  4. Sediment Deposition of islands or point bars and less than <20% of the bottom affected by sediment deposition in pools.  Score 16  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  4. Sediment Deposition of islands or point bars and less than <20% of the bottom affected; sight deposition in pools.  Score 16  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  5. Channel Flow Status  Score 16  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  5. Channel Flow Status  Score 16  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  6. Channel Alteration  Majority of pools small Majority of pools small shallow, propols absent.  Majority of pools small shallow, more prevalent than deep pools prevalent.  Majority of pools small shallow, more prevalent than deep pools prevalent than deep pools absent.  Majority of pools small shallow, more prevalent than deep pools small shallow or pools absent.  Majority of pools small shallow, more prevalent than deep pools prevalent than deep pools absent.  Majority of pools small shallow pools much more prevalent than deep pools prevalent than de	Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.				
Vegetation common.   Vegetation present.	Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged					
Score 6 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  3. Pool Variability Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.  Score 1 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  4. Sediment Deposition		mats and submerged	and submerged	vegetation.					
3. Pool Variability Even mix of targeshallow, targe-deep, smallshallow, small-deep pools present.  Score 1		vegetation common.	vegetation present.						
Second   1	Score 6								
large-deep, small-shallow, small-deep pools present.   few shallow   pools.	•	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
Score 1	3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small				
A.Sediment Deposition  Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.  Score 16  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  Moderate deposition of new gravel, sand or fine sediment on old and new sediment on old and new bottom affected; slight deposition in pools.  Score 16  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  Mater reaches base of both lower banks, and miminal amount of channel substrate is exposed.  Score 1  Channel Status  Channel Status  Channel Strate is exposed.  Channel Channelization or dredging absent or miminal; stream with normal pattern.  Deposition in pools.  Some channel subtrate is evidence of past minimal; stream with normal past 20 yr) may be present, but recent channelization is not  Moderate deposition of new gravel, sand or fine sediment on old and new baction affected; sediment development; more than 80% of the bottom affected; sediment on obstructions, and bends; moderate deposition of new gravel, sand or fine sediment on old and new baction affected; sediment on obstructions, and bends; more strated eposition of new gravel, sand or fine sediment on old and new baction affected; sediment deposition on deposition on deposition on pools.  Heavy deposits of fine material, increased bar development; more than 80% of the bottom affected; sediment on old and new bactions, constrictions, and bends; more standles and or remetizations, constrictions, and bends; more standles and sediment on old and new bactions and bends; more standles and sediment on old and new bactions and or remetizations, constrictions, and bends; more standles and or remetizations, constrictions, and bends; more standles and or remetizations, constrictions, and or remetizations, constrictions, and or remetizations, constrictions, and or remetization or deposition or pools prevalent.  Score 16  Deposition 17  Water reaches base of water fills 25-75% of the available channel, and/or riffle substrates are mostly present as standing		large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.				
4.Sediment Deposition  Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.  Score 16  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 0 1 10 10 10 10 10 10 10 10 10 10 1		small-deep pools present.	few shallow	pools.					
Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.  Score 16	Score 1								
Deposition  of islands or point bars and less than <20% of the bottom affected by sediment deposition.  bar formation, mostly from gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; slight deposition in pools.  Score 16  20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  Status  Score 1  Channel Status  Dar formation, mostly from gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposition of pools prevalent.  Score 16  Channel Flow Status  Score 1  Channel Status  Dar formation, mostly from gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposition of pools prevalent.  Score 16  Channel Status  Dar formation, mostly bars, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposition of pools prevalent.  Score 16  Channel Status  Dar formation, mostly bars; 50-80% of the bottom affected; sediment deposition of pools prevalent.  Water fills 25-75% of the available channel; or available channel; or fiffle substrates are mostly exposed.  Score 1  Channelization or dredging absent or minimal; stream with normal pattern.  Channelization, i.e., channelization, i.e., channelization, i.e., channelization, i.e., channelized and disrupted.  Dar formation, index deposition of bottom affected; sediment deposition.  Dar formation, index desertion of substraction sediment deposition of pools prevalent.  Dar formation, index deposition of substracted; sediment deposition of pools prevalent.  Dar formation, index deposition of pools prevalent.  Dar formation, inde	•	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
Score 16		of islands or point bars and less than <20% of the bottom affected by	bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight	new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of	material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment				
Score 1	Score 16				<del>'</del>				
Score 1	ocore 10		15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
Score  1		Water reaches base of both lower banks, and mimimal amount of channel substrate is	Water fills >75% of the available channel; or <25% of channel	Water fills 25-75% of the available channel, and/or riffle substrates are	Very little water in channel and mostly				
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0  6. Channel  Alteration  Channelization or dredging absent or minimal; stream with normal pattern.  Channelization or dredging, (greater than past 20 yr) may be present, but recent channelization is not  Channelization may be extensive; embankments or channelization present on both banks; and 40 to 80% of stream latered or removed entirely.	Score 1								
Channel Alteration  Channelization or dredging absent or minimal; stream with normal pattern.  Channelization or dredging absent or minimal; stream with normal pattern.  Channelization or present, usually in areas of bridge abutments; or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  Instream habitat greatly altered or removed entirely.		20 19 18 17 16	15 14 13 12 11	10 9 8 7					
P-555		Channelization or dredging absent or minimal; stream with normal	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed				
	Score 8								
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0		20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				

7. Channel		The bends in t	The bends i	The bends	in the stre	eam	Channel straight;							
Sinuosity		increase the s	tream		increase the	stream		increase th	e stream		waterway ha	is been		
		length 3 to 4 ti	mes long	er	length 2 to 3	3 times lo	onger	length 1 to	2 times lo	nger	channelized	for a long	g	
		than if it was ir	n a straigh	nt	than if it was	s in a str	aight	than if it wa	s in a stra	aight	distance.			
		line. (Note - ch	nannel		line.			line.						
		braiding is con	sidered											
		coastal plains												
		normal low-lyin												
		this parameter	-											
		easily rated in												
		areas.)												
Score 6		ш г		$\overline{\Box}$		пг	<del></del>	<del>-</del>		7 🔽			$\neg$ $\neg$	
00010		20 19 1	<u>.                                    </u>	<u>1</u> 6	15 14	13	<u> </u>	 L 10	<u>ы</u> 98	<u> </u>	6 5 4	<u> </u>	2 1	
		20 19 1	.0 17	10	13 14	13	12 11	1	9 0		U J 4		2 1	
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable	; 30-	Unstable; m	any erode	ed areas;	
(score each ban	k)	of erosion or b	ank failur	e	infrequent, s	small are	eas of	60% of ban	k in reach	n has	"raw" areas	frequently	y along	
Note: determine left	or	absent or mini	mal; little		erosion mos	stly heale	ed	areas of er	osion; hig	h	straight sect	ions and	bends;	
right side by facing		potential for fu	ture		over. 5-30%	of bank	in	erosion pot	_		obvious ban			
downstream.		problems. <5%			reach has a			floods.		J	60-100% of	J	0,	
· · · ·		affected.			erosion.						erosional sc			
Score (LB)	1					П		$\Box$	$\overline{}$			<u> </u>	$\neg$	
000.0 (22)	•	Left Bank	10	9	8	7	6	<u></u>	4	3	2	1		
Score (RB)	1	Left Dank		Ť	$\overline{}$		$\overline{}$		$\overline{\neg}$	$\overline{\Box}$		<u> </u>		
Score (IVD)	•	Diaht Dank	<u> </u>	9	<u> </u>	7	<u>Ц</u> 6	<u></u>	<u> </u>	3	<u></u>	<u> </u>		
		Right Bank	10	9	0		- 0	<u> </u>	-4					
9. Vegetative		More than 90%	% of the		70-90% of t	he streai	m-	50-70% of	the strear	n-	Less than 50	0% of the		
Protection (sco	ore	streambank su	urfaces ar	nd	-bank surfac	ces cove	red	bank surfac	es cover	ed	streambank surfaces			
each bank)		immediate ripa	arian zone	es	by native ve	getation	, but	by vegetati	on; disrup	otion	covered by vegetation;			
Note: determine left	or	covered by na			one class of	-		obvious; pa			disruption of	•		
right side by facing		vegetation, inc			not well rep			soil or close			vegetation is			
downstream.		trees, understo	•	2	disruption e			vegetation			vegetation h		, ,	
downstream.		or nonwoody	ory Siliub	3,	affecting full			than one-ha	-	1033	removed to	as been		
		,	voqototiv	^	•					lo.		o or loop	in	
		macrophytes;	-	<del>U</del>	potential to			potential pl		ie	5 centimeter			
		disruption thro			extent; more			height rema	aining.		average stul	obie neigi	nt.	
		grazing or mov	•		half of the p									
		minimal or not			stubble heig	tht remai	ınıng.							
		almost all plan		d										
		to grow natura	ılly.											
Score (LB)	0												<b>✓</b>	
		Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	0												V	
		Right Bank	10	9	8	7	6	5	4	3	2	1		
10. Riparian		Width of riparia	an zone		Width of ripa	arian zor	ne 12-	Width of rip	arian zon	ne 6-	Width of ripa	rian zone	- 6	
Vegstative Zor	10	>18 meters; h			18 meters; h			12 meters:			meters: little			
_												•		
Width (score ea	acn	activities (i.e.,	-		activities ha			activities ha		cted	vegetation d	ue to hun	nan	
bank riparian		lots, roadbeds	, clear-		zone only m	inimally.		zone a grea	at deal.		activities.			
zone)		cuts, lawns, or	r crops)											
		have not impa	cted zone	<del>)</del>										
Score (LB)	1											<b>✓</b>		
		Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	0												<b>V</b>	
-		Right Bank	<u>1</u> 0	9	8	7	6	5	4	3	2	1		
TOTAL SCORE	42													

Project ID:	Somerville	South A	mendı	2	Stream Class:					Ephemeral				
Stream ID:	#14(8A)					Lo	catio	n:		Mack	cey, IN			
Lat:	38.23104	Long:		-87.3	35141	Riv	/er Ba	asin:		Ohio				
Investigators:	Nate Nola	nd												
Cianatura				Dat	e:	ļ	5-May	/-2011		Reas	on for Sur	vey:		
Signature:				Tim	ie:			4:2	21 PM	404 F	unctional	Asses	sment	
WEATHER		Current				Past 2	24-Ho	urs		Heavy rain in last 7-days				'S
CONDITIONS		Storm (H	Heavy Ra	ain)		Stor	m (Hea	avy Rair	n)		□NO	✓ Yes	5	
		Rain Ste	ady			Rair	n Stead	у			Air Temp	°C	•	18
		Showers	(Interm	ittent)		Sho	wers (I	ntermit	tent)		Air Temp	°F	(	<b>3</b> 5
		Cloud Co	over %			☑ Clou	ud Cove	er %		90	Other:			
		✓ Clear/Su			Clea	ar/Sunn	ıy							
OITE LOCATIO		0 44		4										
SITE LOCATION	JN/IVIAP	See Atta	acnme	ent										
STREAM		Stream S	ubsys	tem						Strea	am Type			
CHARACTER	IZATION	Perennia	al 🗀	Interm	ittent	✓Ep	hemer	al		Со	ldwater			
										<b>✓</b> w	armwater			
		Stream C	rgin								Catc	hment	Area	
		Upland	Runoff		☑	Mixture	of Orig	ins			Mile <sup>2</sup>	2	0.	.05
		Spring-f	ed/Groui	nd wate		Wetland		Other			Km <sup>2</sup>		0	).1
WATEROUER					0 5		4			ocal Watershed NPS Polluntion				
WATERSHED		Surround	ing L	and u			_			No evidence Some potential sources				
FEATURES		Forest			_	mmercia	I	-00	_	•				
		Field/Pa		000/	☑ Oth			20		Obvious sources Ag. induced sediment				
		Agricultu		80%	Logo	<u>lea</u>		_		cal Watershed Erosion  None ☑ Moderate ☐ Heavy				
		Resident	tial						Nor	ne <u></u> ✓	' Moderate	Heav	/y	
RIPARIAN		Indicate	the do	minar	nt type	e and	redor	d the	domir	nant s	species pre	esent		
VEGETATION		Trees	<b>✓</b> Shrul	os 🗀	Grasse	es 🔲	Herbs		None					
(18 meter buff	fer)	Dominan	t Spec	cies:	Logg	jed co	rridoı	r, ag f	ield, m	nining	g haul road	l		
INICTOFAM		Fat Dage	la I	41-		£ı.	705		000		0			
INSTREAM							785				Canopy C			
FEATURES		Est. Strea				ft ft <sup>2</sup>	0	m m²	0.0		☑ Open		artly Ope	
		Sampling Sampling				mile <sup>2</sup>	0 0.0	km <sup>2</sup>	0		Shaded	ШР	artly Shad	dedC
		Area in kr		IIIIE		mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		11:	N 4 =l -	4.	0.00
				L			0.0		0.0		High Water		ft	0.00
		Est. Wate				in #/-	/	m	0.0		High Water		m	0.00
		Surface V	elocity	′		ft/s	n/a	m/s	####		% of Stream		0.	
		Oh a a a a l'	- a d	,						=	fle %	Rui		
		Channeliz	_	Yes	☑ No					_	ol %	∐ Glid	de Pool	
		Dam Pres	sent [	Yes	<b>✓</b> No	·				St∈	ep Pool Series			
LARGE WOOD DEBRIS	Υ	LWD	0.0	_m²		0 1	ft <sup>2</sup>							
		Density o	of LWI	)	m²/kı	m²	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	0.	000000	0000

VEGETA		Indicate the dor  ✓ Rooted Emerger	ninant type and re			• •	esent □Non∈	,	
		Free Floating	Attached Alg	•		Floating Algae	<b>—</b>	•	
		Portion of the re	each with aquatic	vegetat	ion pr	esent		60 %	
WATER	QUALITY	Temperature	#### °C n/a	°F	Wat	er Odors			
		Conductivity	μs/cm		□N	ormal/None Se	wage	Petroleum	
		Total Dissolved	Solids	mg/l	С	hemical An	aerobic		
No V	Vater Prese	ent pH							
		Turbidity			Wat	er Surface Oils			
		☐ Clear ☐ S	light Turbid 🔲 Tur	bid			Globs	Flecks	
		Opague S	tained Oth	ier		Other			
SEDIME	NT/	Odors				Deposits			
SUBSTR	ATE	✓ Normal	Sewage P	etroleum		☐ Sludge ☐ Saw	dust _	Paper fiber Sa	and
		Chemical	Anaerobic N	lone		Relic Shells	Other		
		Other							
		Oile				Looking at stone			
		Oils  ☑ Absent ☐ S	Slight  Moderate	Пь	rofuse	embedded, are u		D No □	or?
IN	ORGANIC	SUBSTRATE COMP	<u> </u>			SANIC SUBSTRA			
Substrate	Ī		e inSampling	Subst		Characteris		% Composition	on in
Туре			each	Тур		31141 413 613		Sampling Rea	
Bedrock				Detr		Sticks, wood, co	oarse		
Boulder	>10"					plant materi	al		
Cobble	2.5 - 1			Mud		Black very fir			
Gravel	0.1 - 2.			Mu		organic matt			
Sand	gritty		5	Ма	arl	Grey, shel			
Silt Clay	gooey slick	<u> </u>	85 10			fragments			
				NAENIT	1.01	* OD A DINET OF			
	oitat meter		ABITAT ASSESS SubOptima		- LOV		KEAN		
1. Epifaui		Optimal Greater than 50%	30-50% for low	aı	10-309	Marginal 6 for low	10% for	Poor	
Substrat		for low gradient streams)	gradient streams) mi	x of		nt streams) mix of		dient streams)	
Available		of substrate favorable for	stable habitat; well-s			habitat; habitat	_	abitat; lack of	
Cover		epifaunal colonization &	for full colonization			oility less than		s obvious;	
		fish cover; mix of snags,	potential; adequate h	abitat	desirat	ole; substrate	substra	te unstable or	
		submerged logs, undercut	for maintenance of		freque	ntly disturbed or	lacking.		
		banks, cobble or other	populations; presenc	e of	remove	ed.			
		stable habitat & at stage	additional substrate i	n					
		to allow full colonization	form of newfall, but n	ot					
		potential (i.e., logs/snags	yet prepared for						
		that are not new fall and	colonization (may rat	e at					
Score	1	not transient).	high end of scale).	1 [			<u> </u>		$\vdash$
	•	20 19 18 17 16	6 15 14 13 :	12 11		) 9 8 7	6 5	4 3 2	1 0

2. Pool	Mixture of substrate Mixture of soft sand, mud All m	nud or clay or sand Hardpan clay of bedrock: no				
Substrate	materials, with gravel and or clay; mud may be botto	om: little or no root root mat or vegetation.				
Characterization	firm sand prevalent; root dominant; some root mats mat:	no submerged				
	mats and submerged and submerged vege	etation.				
	vegetation common. vegetation present.					
Score 6						
•	20 19 18 17 16 15 14 13 12 11 1	10 9 8 7 6 5 4 3 2 1 0				
3. Pool Variability	Even mix of largeshallow, Majority of pools Shall	llow pools much Majority of pools small				
		e prevalent than deep shallow or pools absent.				
	small-deep pools present. few shallow pools					
Score 1						
-	20 19 18 17 16 15 14 13 12 11 1	10 9 8 7 6 5 4 3 2 1 0				
4.Sediment	Little or no enlargement Some new increase in Mode	erate deposition of Heavy deposits of fine				
Deposition	of islands or point bars bar formation, mostly new	gravel, sand or fine material, increased bar				
	and less than <20% of from gravel, sand or fine sedir	ment on old and new development; more than				
	the bottom affected by sediment; 20-50% of the bars;	; 50-80% of the 80% of the bottom				
	sediment deposition. bottom affected; slight botto	om affected; sediment changing frequently; pools				
	deposition in pools. depo	osits at obstructions, almost absent due to				
	cons	strictions, and bends; substantial sediment				
	mode	erate deposition of deposition.				
	pools	s prevalent.				
Score 3						
·	20 19 18 17 16 15 14 13 12 11 1	10 9 8 7 6 5 4 3 2 1 0				
5. Channel Flow						
		er fills 25-75% of the Very little water in				
Status		lable channel, and/or channel and mostly				
		substrates are present as standing pools.				
		tly exposed.				
0	exposed.					
Score 1						
	20 19 18 17 16 15 14 13 12 11 1	10 9 8 7 6 5 4 3 2 1 0				
6. Channel	Channelization or Some channelization Char	nnelization may be Banks shored with gabion				
Alteration	dredging absent or present, usually in areas exter	nsive; embankments or cement; over 80% of				
	minimal; stream of bridge abutments; or sh	noring structures the stream reach				
	with normal evidence of past prese	ent on both banks; channelized and disrupted.				
	pattern. channelization, i.e., and 4	40 to 80% of stream Instream habitat greatly				
		h channelized and altered or removed				
		upted. entirely.				
	present, but recent	,				
	channelization is not					
	present.					
Score 11		<del>, , , , , , , , , , , , , , , , , , , </del>				
1,1		10 9 8 7 6 5 4 3 2 1 0				
Ī	<u></u>	10				

7. Channel		The beauty to the	(l t	_	Tt t	. () (.		The beauty			01	. t . l. t	1	
		The bends in t	The bends i			The bends		eam	Channel straight; waterway has been					
Sinuosity		increase the s			increase the			increase th			•			
		length 3 to 4 ti	-		length 2 to 3		•	length 1 to		ŭ	channelized	for a long	g	
		than if it was in	•	nt	than if it was	s in a str	aight	than if it wa	s in a stra	aight	distance.			
		line. (Note - ch	nannel		line.			line.						
		braiding is cor	nsidered											
		coastal plains	and other	•										
		normal low-lyi	ng areas.											
		this paramete	r is not											
		easily rated in	these											
		areas.)												
Score 6	3													
		20 19 1	8 17	16	15 14	13	12 11	. 10	9 8	7	6 5 4	. 3	2 1	
9 Pank Stabili	i4.,	Darelia etable:			Madanatak	-4-bl-:		Madaustali		. 20	l la stable : as			
8. Bank Stabili	-	Banks stable;		_	Moderately			Moderately			Unstable; m	•		
(score each ban	•	of erosion or b		е	infrequent, s			60% of ban			"raw" areas			
Note: determine left	or	absent or mini	,		erosion mos	•		areas of er			straight sect		•	
right side by facing		potential for fu			over. 5-30%		( In	erosion pot	entiai dur	ing	obvious ban	J	o,	
downstream.		problems. <5%	% of bank		reach has a	reas or		floods.			60-100% of			
0 (I D)	_	affected.	_	_	erosion.	_	_	<u> </u>	_		erosional so	ars.		
Score (LB)	6			Ť		ᆜ	<u> </u>		Ц	Щ.		$\perp$	Ш	
<b>(7.7)</b>		Left Bank	10	9	8	7	6	5	4	3	2	1_		
Score (RB)	6		Ш		Ш	Ш	<b>✓</b>		Ш		Ш	Ш	Ш	
		Right Bank	10	9	8	7	6	5	4	3	2	1		
9. Vegetative		More than 90%	% of the		70-90% of tl	he strea	m-	50-70% of	he strear	m-	Less than 5	0% of the		
Protection (sc	ore	streambank si		nd	-bank surfac			bank surfac						
each bank)		immediate ripa			by native ve			by vegetation			streambank surfaces covered by vegetation;			
Note: determine left	or	covered by na		,3	one class of	-		obvious; pa			disruption of streambank			
right side by facing	. 01	vegetation, inc	not well rep	•		soil or close			vegetation is					
downstream.		trees, underst	•		disruption e			vegetation			vegetation is		11,	
downstream.		or nonwoody	ory Siliub	5,	l '			than one-ha		1699	removed to	as been		
		,	voaststiv	^	affecting full			potential pla		lo.	5 centimete	o or loop	in	
		macrophytes;	•	<del>U</del>	potential to					i <del>e</del>				
		disruption thro			extent; more			height rema	aming.		average stu	oble neig	nt.	
		grazing or mo	•		half of the p									
		minimal or not	-		stubble heig	ınt rema	ining.							
		almost all plar		a										
Coore (LD)	0	to grow natura	ally.	_			_		_	_			_	
Score (LB)	8	Laft David	10	Щ.	<u> </u>	Ц_	Ц		Ц					
Carra (DD)	•	Left Bank	10	9	8	7_	6	5	4	3	2	1_		
Score (RB)	8	Dielet Devel	10	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>					
		Right Bank	TO	9	8 I	7	6	5 I	4	3	2 I	1		
10. Riparian		Width of ripari	an zone		Width of ripa	arian zoi	ne 12-	Width of rip	arian zor	ne 6-	Width of ripa	arian zone	e <6	
Vegstative Zor	ne	>18 meters; h			18 meters; h			12 meters;			meters: little			
Width (score ea		activities (i.e.,			activities ha		cted	activities ha		rtad	vegetation of	·		
-	uon		-			•			•	leu		ue to nui	IIaII	
bank riparian		lots, roadbeds			zone only m	ıınımaliy	•	zone a grea	at deal.		activities.			
zone)		cuts, lawns, or	. ,											
		have not impa	cted zone	). 	<u></u>			<u> </u>			<u> </u>			
Score (LB)	1											<b>✓</b>		
		Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	1											<b>V</b>		
		Right Bank	10	9	8	7	6	5	4	3	2	1		
TOTAL SCORE	59							_						

Project ID:	Somerville	South An	nendmen	t 2	Stream Class:				Ephemeral				
Stream ID:	#15				Lo	catio	n:		Mack	key, IN			
Lat:	38.23262	Long:	-87	7.36085	Riv	ver B	asin:		Ohio	1			
Investigators:	Will Nolan	ıd											
Signature:			D	ate:	,	5-May	<b>/-2011</b>		Reas	on for Sur	vey:		
Signature.			Ti	me:			5:4	7 PM	404 Functional Assessment				
WEATHER		Current			Past 2	24-Ho	ours			Heavy rain	n in las	t 7-day	'S
CONDITIONS		Storm (He	eavy Rain)		Storm (Heavy Rain)					□NO	✓ Yes		
		Rain Stea	dy		Rair	n Stead	ly			Air Temp			18
		Showers	-	t)		-	Intermit	tent)		Air Temp	°F		65
		Cloud Cov			✓ Clou				90	Other:			
		✓ Clear/Sun	iny		Clea	ar/Sunr	ny						
SITE LOCATION	ON/MAP	See Atta	chment										
STREAM		Stream Su	_		_					am Type			
CHARACTERI	☐ Inte	rmittent	<b>∠</b> Ep	ohemer	al		_	ldwater					
			_						✓ W	armwater		_	
		Stream O	_								hment		••
		Upland R			Mixture	_				Mile <sup>2</sup>			.02
		Spring-fee	d/Ground wa	iter	Wetland	i []	Other			Km <sup>2</sup>		- 0	).1
WATERSHED		Surroundi	ing Land	use & l	Percen	tage		Loca	l Wat	ershed NP	S Pollu	ıntion	
FEATURES		✓ Forest	5	<b>%</b> □ Co	mmercia	ıl		□No	eviden	ce So	me potei	ntial sourc	es
		☐ Field/Past	ure	<b>✓</b> Ot	her		50	<b>✓</b> Ob	vious s	ources Ag.	induc	ed sedi	ment
		✓ Agricultur	e <b>45</b>	% <u>Log</u> g	<u>ged</u>			Loca	l Wat	ershed Erc	sion		
		Residentia	al					No	ne 🔽	' Moderate	Heav	/y	
RIPARIAN		Indicate th	ne domin	ant tvn	e and i	redor	d the	domii	nant s	species pre	eent		
VEGETATION		Trees		Grass		Herbs		None	iuiii	produce pro	,50111		
(18 meter buff		Dominant		_	rian co		_						
,	,		•					<b>5</b> 4					
INSTREAM		Est. Reach				166		51		Canopy C			
FEATURES		Est. Stream			ft ft <sup>2</sup>	0	m m²	0.0		Open		artly Ope	
		Sampling I Sampling I			mile <sup>2</sup>	0.0	km <sup>2</sup>	0		Shaded	∐Р	artly Shad	dedC
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		11:	N 4 =l -	44	0.00
								0.0		High Water		ft	0.00
		Est. Water	•		in #/o	1.0	m m/a	0.0		High Water		m	0.00
		Surface Ve	Siddity		ft/s	0.1	m/s	0.0		% of Stream			
		Channaliza	od □	[]						fle %	Rui		
		Channelize Dam Prese	_	✓ No					Po		∟ Glio	de Pool	
									□ 20	ep Pool Series			
LARGE WOOD DEBRIS	Y	LWD 0	0.0 m <sup>2</sup>		0 1	ft <sup>2</sup>							
		Density of	f I WD	m²/k	m²	0.00	00000	000		ft <sup>2</sup> /mile <sup>2</sup>	0	იიიიი	0000

AQUATION			Indicate the dom	ninant type and re	cord th	e don	ninant species pro	esent	
VEGETA	TION		✓ Rooted Emergen		_			None	2
			☐ Free Floating	Attached Alga	ae		Floating Algae		
			Portion of the re	ach with aquatic	vegetat	ion pr	esent		5 %
WATER	QUALITY		Temperature Conductivity Total Dissolved pH 7.3	17.2 °C 63 μs/cm Solids 141	°F 198.1 mg/l	☑ c	_	wage aerobic	Petroleum
				ght Turbid Turbained Oth			er Surface Oils Slick ☐ Sheen ☐ Other	Globs	Flecks
SEDIME	NT/		Odors				Deposits		
SUBSTR	ATE		✓ Normal	Sewage Pe	etroleum			dust _	Paper fiber Sand
			Chemical	Anaerobic N	lone		Relic Shells	Other	
			Other						
							Looking at stone		• •
			Oils  ☑ Absent ☐ SI	:		rofuse	embedded, are u		des black in color? ☐ No
IN	IOPGANIC	CIID	Absent SI	<u> </u>	<u> </u>				
Substrate				e inSampling	Subst	-	Characteris		% Composition in
Type	Biame	.01	-	ach	Тур		Gilaracteris		Sampling Reach
Bedrock					Detr		Sticks, wood, co	oarse	γ σ
Boulder	>10"						plant materi	al	
Cobble	2.5 - 1	0"			Mud	ck-	Black very fir	ne	
Gravel	0.1 - 2.			5	Mυ		organic matt		
Sand	gritty			55	Ма	arl	Grey, shell		
Silt	gooey		2	10			fragments		
Clay	slick								
		T							
	bitat			ABITAT ASSESS		- LOV		REAN	
	meter		Optimal	SubOptima			Marginal		Poor
1. Epifau	meter nal		Optimal or than 50%	SubOptima 30-50% for low	al	10-30%	Marginal 6 for low	10% for	Poor
1. Epifau Substrat	meter nal :e/	for low	Optimal or than 50% gradient streams)	SubOptima 30-50% for low gradient streams) mix	x of	10-30% gradier	Marginal 6 for low nt streams) mix of	10% for	Poor dient streams)
1. Epifau Substrat Available	meter nal :e/	for low	Optimal or than 50% gradient streams) strate favorable for	SubOptima 30-50% for low gradient streams) mix stable habitat; well-su	x of	10-30% gradier stable	Marginal 6 for low ht streams) mix of habitat; habitat	10% for low grad	Poor dient streams) abitat; lack of
1. Epifau Substrat	meter nal :e/	for low of subs epifaur	Optimal or than 50% gradient streams) strate favorable for hal colonization &	SubOptima 30-50% for low gradient streams) mix stable habitat; well-su for full colonization	x of uited	10-30% gradier stable availab	Marginal 6 for low nt streams) mix of habitat; habitat bility less than	10% for low grad stable h	Poor dient streams) abitat; lack of s obvious;
1. Epifau Substrat Available	meter nal :e/	for low of subs epifaur fish co	Optimal or than 50% gradient streams) strate favorable for hal colonization & over; mix of snags,	SubOptima 30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h	x of uited	10-30% gradier stable availab desirab	Marginal 6 for low ht streams) mix of habitat; habitat bility less than ble; substrate	10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of
1. Epifau Substrat Available	meter nal :e/	for low of subs epifaur fish co subme	Optimal or than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut	SubOptima 30-50% for low gradient streams) mix stable habitat; well-su for full colonization	x of uited abitat	10-30% gradier stable availab desirab	Marginal 6 for low ht streams) mix of habitat; habitat bility less than ble; substrate htly disturbed or	10% for low grad stable h	Poor dient streams) abitat; lack of s obvious;
1. Epifau Substrat Available	meter nal :e/	for low of subs epifaur fish co subme banks,	Optimal or than 50% gradient streams) strate favorable for hal colonization & over; mix of snags,	SubOptima 30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of	x of uited abitat	10-30% gradier stable availab desirab frequer	Marginal 6 for low ht streams) mix of habitat; habitat bility less than ble; substrate htly disturbed or	10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of s obvious;
1. Epifau Substrat Available	meter nal :e/	for low of subs epifaui fish co subme banks, stable	Optimal or than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other	SubOptima 30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence	x of uited abitat e of	10-30% gradier stable availab desirab frequer	Marginal 6 for low ht streams) mix of habitat; habitat bility less than ble; substrate htly disturbed or	10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of s obvious;
1. Epifau Substrat Available	meter nal :e/	for low of subs epifaur fish co subme banks, stable to allow	Optimal or than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage	SubOptima 30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence additional substrate in	x of uited abitat e of	10-30% gradier stable availab desirab frequer	Marginal 6 for low ht streams) mix of habitat; habitat bility less than ble; substrate htly disturbed or	10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of s obvious;
1. Epifau Substrat Available	meter nal :e/	for low of subs epifaur fish co subme banks, stable to allow potenti	Optimal or than 50% gradient streams) strate favorable for hal colonization & ever; mix of snags, rged logs, undercut cobble or other habitat & at stage or full colonization	SubOptima 30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence additional substrate in form of newfall, but n	x of uited abitat e of n	10-30% gradier stable availab desirab frequer	Marginal 6 for low ht streams) mix of habitat; habitat bility less than ble; substrate htly disturbed or	10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of s obvious;
1. Epifau Substrat Available	meter nal :e/	for low of subsepifaul fish co subme banks, stable to allow potentithat are	Optimal or than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage v full colonization al (i.e., logs/snags	SubOptima 30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence additional substrate in form of newfall, but n yet prepared for	x of uited abitat e of n	10-30% gradier stable availab desirab frequer	Marginal 6 for low ht streams) mix of habitat; habitat bility less than ble; substrate htly disturbed or	10% for low grad stable h habitat i substrat	Poor dient streams) abitat; lack of s obvious;

2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock	Hardpan clay of bedrock: no				
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.					
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged					
	mats and submerged and submerged vegetation.					
,	vegetation common. vegetation present.					
Score 6						
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2	1 0				
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small	Majority of pools small				
	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent	shallow or pools absent.				
	small-deep pools present. few shallow pools.	onanow or poole abcorn.				
Score 4						
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2	1 0				
Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.  Some new increase in bar formation, mostly from gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; slight deposition in pools.  Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposition in pools.  Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pool almost absent due to substantial sediment deposition.					
	pools prevalent.	,				
Score 17		6         5         4         3         2         1         0				
Status	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2  Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.  Water fills >75% of the available channel; or channel substrate is exposed.  Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.					
Score 7						
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2	1 0				
Alteration	Channelization or dredging absent or present, usually in areas or shoring structures or cement; over 80% of with normal evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent Channelization may be extensive; embankments or cement; over 80% of the stream reach or shoring structures the stream reach channelized and disrupted and disrupted.  Channelization may be extensive; embankments or cement; over 80% of the stream reach channelized and disrupted and disrupted.	n				
	channelization is not present.					
Score 16						

7. Channel		The bends in t	The bends	in the str	eam	The bends	in the stre	eam	Channel straight;					
Sinuosity		increase the s	tream		increase th	e stream		increase th	e stream		waterway ha	is been		
		length 3 to 4 ti	imes long	er	length 2 to	3 times lo	onger	length 1 to	2 times lo	nger	channelized	for a lon	g	
		than if it was in	n a straigl	nt	than if it wa	as in a str	aight	than if it wa	is in a stra	aight	distance.			
		line. (Note - ch	nannel		line.			line.						
		braiding is cor	nsidered											
		coastal plains		r										
		normal low-lyi												
		this parameter	•											
		easily rated in												
		areas.)												
Score 6	3	ПГ		П			$\neg \neg$	<del>'</del>		7 🔽		$\overline{\Box}$		
00010	,	20 19 1	8 17	<u>1</u>	15 14	13	<u></u> 12 11	 10	<u>ы</u> 98	<u> </u>	6 5 4	<u> </u>	2 1	
		20 15 1	.0 17	10	15 17	, 13	12 13	1 10	<del>5</del>				2 1	
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable	; 30-	Unstable; ma	any erod	ed areas;	
(score each ban	k)	of erosion or b	ank failur	е	infrequent,	small are	eas of	60% of bar	ık in reach	n has	"raw" areas	frequentl	y along	
Note: determine left	or	absent or mini	imal; little		erosion mo	stly heale	ed	areas of er	osion; hig	h	straight sect	ions and	bends;	
right side by facing		potential for fu	ıture		over. 5-30%	% of bank	in	erosion pot	ential dur	ing	obvious ban	k sloughi	ng;	
downstream.		problems. <5%	% of bank		reach has	areas of		floods.		-	60-100% of	bank has	-	
		affected.			erosion.						erosional sc			
Score (LB)	7			$\overline{}$		$\overline{\mathbf{V}}$			$\overline{\Box}$	$\neg$				
(==)	-	Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	7	Lere Barric	$\overline{\Box}$	Ť	Ť		Ť	$\vec{}$	$\overline{}$	一		$\overline{}$	$\neg$	
ocore (IVD)		Right Bank	<u> </u>	9	<u> </u>	<u> </u>	<u> </u>	<u> </u>	4	<u> </u>	<u></u>	1		
		Nigiit Dalik	10	,	l o		- 0	<u> </u>						
9. Vegetative		More than 90%	% of the		70-90% of	the strea	m-	50-70% of	the stream	n-	Less than 50	0% of the		
Protection (sco	ore	streambank si	urfaces ar	nd	-bank surfa	aces cove	red	bank surfac	ces covere	ed	streambank surfaces			
each bank)		immediate ripa	arian zone	es	by native v	egetation	, but	by vegetati	on; disrup	tion	covered by vegetation;			
Note: determine left	or	covered by na	itive		one class of	of plants i	s not	obvious; pa	atches of b	oare	disruption of	streamb	ank	
right side by facing		vegetation, inc	cluding		not well rep	oresented	i	soil or close	ely croppe	ed	vegetation is	very hig	h;	
downstream.		trees, underst	-	S.	disruption 6			vegetation			vegetation h			
		or nonwoody	0., 0	Ο,	affecting fu			than one-h		.000	removed to	uo 200		
		macrophytes;	vegetativ	e	potential to			potential pl		e	5 centimeter	s or less	in	
		disruption thro	-	•	extent; moi			height rema		Ü	average stul			
					· ·			neigni rem	allillig.		average siui	ble fielg	111.	
		grazing or mo	•		half of the									
		minimal or not	-		stubble hei	igni rema	ming.							
		almost all plan		d										
0 (1.5)	_	to grow natura	ally.	_	L			L						
Score (LB)	4	. (. 5 . 1		一	<u> </u>	Ц_	Щ	<u> </u>	$\overline{\vee}$	_Ц_	<u> </u>	$\Box$		
0 · · · (DD)		Left Bank	10	9	8		6	5	4	3	2	1_	_	
Score (RB)	4	D: 1 - D - 1	<u> </u>	<u> </u>	<u> </u>	_닠_	<u> </u>	<u> </u>	$\overline{\square}$		<u> </u>		Ш	
		Right Bank	10	9	8	7	6	5	4	3	2	1		
10. Riparian		Width of ripari	an zone		Width of rip	oarian zor	ne 12-	Width of rip	arian zon	e 6-	Width of ripa	rian zone	e <6	
Vegstative Zor	ne .	>18 meters; h			18 meters;			12 meters:			meters: little			
Width (score ea							-4	·		.4				
-	acii	activities (i.e.,	-		activities ha			activities ha		ilea	vegetation d	ue to nur	nan	
bank riparian		lots, roadbeds			zone only r	minimally.		zone a grea	at deal.		activities.			
zone)		cuts, lawns, or	r crops)											
		have not impa	cted zone	€.										
Score (LB)	1											<b>✓</b>		
		Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	1											<b>✓</b>		
		Right Bank	10	9	8	7	6	5	4	3	2	1		
TOTAL SCORE	83													

Project ID:	Somerville	South An	nendme	ent 2	Stı	ream	Class	: I	Ephe	meral			
Stream ID:	#15A				Lo	catio	n:	l	Mack	ey, IN			
Lat:	38.23254	Long:	-	87.36054	Riv	ver B	asin:	(	Ohio				
Investigators:	Will												
Cianatura				Date:	;	5-May	/-2011		Reas	on for Surv	ey:		
Signature:				Time:			5:5	52 PM	404 F	unctional A	Asses	sment	
WEATHER		Current			Past 2	24-Hc	urs			Heavy rain	in las	t 7-day	s
CONDITIONS		Storm (He	avy Rain)	)	Sto	rm (He	avy Rair	1)		NO	<b>✓</b> Yes	i	
		Rain Stead	dy		Rair	n Stead	ly			Air Temp °0	С	1	8
		☐ Showers (	(Intermitte	ent)	Sho	wers (I	Intermit	tent)		Air Temp °I	F	•	<b>3</b> 5
		Cloud Cov	er %		<b>☑</b> Clou	ud Cove	er %		90	Other:			
		✓ Clear/Sun	ny		Clea	ar/Sunr	าง						
	21/2442	0 14											
SITE LOCATION	ON/MAP	See Attac	chment	!									
STREAM		Stream Su	ıbsvste	em				,	Strea	ım Type			
CHARACTERI	IZATION	Perennial		ntermittent	✓E	ohemer	al			ldwater			
			_							armwater			
		Stream Or	ain							Catch	ment	Area	
		Upland Ru	_		Mixture	of Oria	iins			Mile <sup>2</sup>			02
		Spring-fed		_	Wetland	_	Other			Km <sup>2</sup>		0	.1
WATERSHED		Surroundi	_			_		Local	Wate	ershed NPS			
FEATURES		✓ Forest		1 <b>0%</b> 🔲 co		ıl		☐ No €				ntial sourc	
		Field/Past		<b>✓</b> Otl	her		90			ources Ag. i		ed sedi	ment
		Agriculture	е	Logo	<u>ged</u>		_	Local	Wate	ershed Eros	sion		
		Residentia	al					Non	e 🗸	Moderate	Heav	У	
RIPARIAN		Indicate th	ne dom	inant type	e and	redor	d the	domin	ant s	species pres	sent		
VEGETATION		Trees		Grasse		Herbs		None	uiii c	peoles pres	30110		
(18 meter buff		Dominant	_					None					
(10 meter ban	<u> </u>		-		jou ui (	-u							
INSTREAM		Est. Reach	Length	า	ft	549	m	167		Canopy Co	ver		
FEATURES		Est. Strear			ft		m	0.0		✓ Open	☐ Pa	artly Opei	า
		Sampling F			ft <sup>2</sup>	0	$m^2$	0		Shaded	☐ Pa	artly Shac	ledC
		Sampling A		le <sup>2</sup>	mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0					
		Area in km	2		mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water M	/lark	ft	0.00
		Est. Water	Depth		in	0.3	m	0.0		High Water M	/lark	m	0.00
		Surface Ve	elocity		ft/s	0.5	m/s	0.2		% of Stream	Morph	ology	
									Rif	fle %	Rur	า %	
		Channelize	ed 🔲 y	es 🔽 No	)				Po	ol %	Glic	de Pool	
		Dam Prese	ent 🔲 y	es 🔽 No	)				Ste	p Pool Series			
I ARCE WOOD	<del></del>	LWD 4	4 "	n <sup>2</sup> 1	5	ft <sup>2</sup>							
LARGE WOOD DEBRIS	ī	LWD 1	<u>.4</u> n	·· <u> </u>	3	11							
DEDKIS		Density of	: 1 \\\\	m²/k	m <sup>2</sup>	0.00	00013	2025		ft <sup>2</sup> /mile <sup>2</sup>	0	000000	5391
		Delisity Of	LVVD	m /K	111	U.UU	, <del>,,,,,</del> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	วฮงง		ıı /IIIIIE	U.U	$\sigma\sigma\sigma\sigma\sigma\sigma$	JJ0 I

AQUATIO			Indica	ate the	e don	ninant	type	and re	ecord th	ne dor	minant sp	ecies p	resent				
VEGETA	TION			oted Em	•	t 📮			nergent	_	Rooted FI	•	✓ Non	е			
			Fre	e Floati	ng	L	Attac	hed Alg	ae		Floating A	Algae					
			Portio	on of t	he re	ach w	ith ac	quatic	vegeta	tion pi	resent			0	%		
WATED	OHALITY							-									
WATER	QUALITY		Temp Cond				°C	56	°F <b>205</b>	1	ter Odors						
					•	µs/cr Solids		144	mg/l	. —	Normal/Non Chemical		ewage naerobic	ЦΡ	etroleı	ım	
			pH	7.5	iveu	Solius	•	144	Jilig/i	Пс	nemicai	L A	naerobic				
			Turbio	•						Wat	ter Surfa	ce Oils					
			✓ Clea			ight Tui	rbid	Tu	bid			Sheen [	Globs		Fleck	5	
			Ора	ague	St	ained		Oth	ner		Other						
SEDIME	NT/		Odor	s							Deposit	ts					
SUBSTR	ATE		✓ No	ormal		Sew	/age		etroleum	1	Sludge	Saw	dust [	Pape	r fiber		Sand
			CH	hemical		Ana	erobic		lone		Relic S	hells	Other				
			□ Ot	ther													
											Looking						•
			Oils		_				_		embedd					in co	olor?
			✓ Ab		S			loderate	<u> </u>	Profuse		Ye					
	IORGANIC										GANIC S						
Substrate	Diame	ter	% (	Comp		e inSa	ampli	ng	Subst		Cha	aracteris	stic		-		ion in
Type					Re	ach			Ty	ne				Sa	mpli	ng R	aach
D. J. J.									1	_	Ottalla			-			Cacii
Bedrock	. 40"								Deti	_		wood, c			•		eacii
Boulder	>10"								Deti	ritus	pla	nt mater	ial				Cacii
Boulder Cobble	2.5 - 1	0"							Deti	ritus ck-	pla Blad	nt mater ck very f	ial ne				Cacii
Boulder Cobble Gravel	2.5 - 1 0.1 - 2	0" .5"				5			Deti Mu Mi	ritus ck- ud	plai Blac orga	nt mater ck very fi anic mat	ial ne ter				eacii
Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2 gritty	0" 5"			Ę	5 50			Deti	ritus ck- ud	plai Blac orga G	nt mater ck very fi anic mat rey, she	ial ine ter II		•		eacii
Boulder Cobble Gravel Sand Silt	2.5 - 1 0.1 - 2 gritty gooe	0" 5" ,			Ę	5			Deti Mu Mi	ritus ck- ud	plai Blac orga G	nt mater ck very fi anic mat	ial ine ter II				eacii
Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick	0" 5" ,			2	5 50 45	ΔΤ Δ9	\$\$F\$\$	Mu Mu Mi	ck- ud arl	plar Blac orga G fr	nt mater ck very fi anic mat rey, she agments	ial ine ter II				eacii
Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick	0" 5" ,	Onti	mal	2	5 50 45			Mu Mu Ma	ck- ud arl	plai Blac orga G fr	nt mater ck very fi anic mat rey, she agments	ial ine ter II				eacii
Boulder Cobble Gravel Sand Silt Clay Hall	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter	0" 5" y	Opti		2	5 50 45 <b>ABIT</b>	Sub	Optim	Mu Mu Ma	ck- ud arl	plai Blac orga G fr W GRAD	nt mater ck very fi anic mat rey, she agments	ial ne ter II	ns.	Poo		eacii
Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y	r than 5	50%	H	5 50 45 <b>ABIT</b>	Sub( % for lo	<b>Optim</b> ow	Mu Mu Mi Mi	ck- ud arl	plai Blac orga G fr	nt mater ck very fi anic mat rey, she agments  DINET S	ial ne ter II S TREAN	ns.	Poo	r	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y		50% nt streai	H/	5 50 45 <b>ABIT</b> A 30-50° gradie	Sub( % for lo	Optim	Mu Mu Ma Ma Ma Ma Ma Ma	ck- ud arl	plai Blac orga G fr W GRAD Margin % for low	nt mater ck very fi anic mat rey, she agments  DINET S  al	ial ne ter II	<b>//S</b>	Poo	r s)	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y	r than 5 gradien	50% nt streai vorable	HA	5 50 45 ABIT A 30-500 gradie stable	Sub( % for lo	Optim ow ams) m t; well-s	Mu Mu Ma Ma Ma Ma Ma Ma	ck- ud arl	plai Blac orga G fr. W GRAD Margin % for low	nt mater ck very fi anic mat rey, she agments  DINET S  al	ial ine iter II S TREAN 10% fo low gra	ns dient s	Poo tream:	r s)	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur	r than 5 gradien strate fa	50% nt strear vorable nization	HA	5 50 45 ABITA 30-50° gradie stable for full	Sub( % for lo ent stream habita colonia	Optim ow ams) m t; well-s	Mu Mi	ck- ud arl	plai Blac orga G fr  W GRAD Margin % for low ent streams) habitat; ha	nt mater ck very fi anic mat rey, she agments  DINET S  al  mix of bitat han	ial ne ter II S TREAN 10% fo low gra stable h	dient s	Poo	r Sistematical states of the s	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish co	r than 5 gradien strate fa	50% Int stream Int stream Introduced to the st	HA ms) e for a & gs,	5 50 45 30-50° gradie stable for full potent	Sub( % for lo ent stream habita colonia	Optim  ow  ams) m t; well-s zation equate l	Mu Mi	ck- ud arl  10-309 gradie stable availal desiral	plai Blac orga G fr.  W GRAD Margin % for low ent streams) habitat; ha bility less th	nt mater ck very fi anic mat rey, she agments  DINET S  nal  mix of bitat han hate	TREAN 10% fo low gra stable habitat	dient s nabitat; is obvi	Poo	r Sistematical states of the s	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme	r than 5 gradien strate fa nal color ver; mix	50% Int stream Introduced stre	H/ ms) e for a & gs, ercut	5 50 45 30-500 gradie stable for full potent for ma	Sub( % for loant stress habita colonia ial; additional	Optim  ow  ams) m t; well-s zation equate l	Mu Mi	ck- ud arl  10-309 gradie stable availal desiral	plai Blac orga G fr.  W GRAD Margin % for low ent streams) habitat; ha bility less th ble; substra ently disturb	nt mater ck very fi anic mat rey, she agments  DINET S  nal  mix of bitat han hate	TREAN 10% fo low gra stable habitat substra	dient s nabitat; is obvi	Poo	r Sistematical states of the s	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish cor subme banks,	r than 5 gradien strate fa nal color ver; mix rged log	50%  Int stream  I	ms) e for a & egs, ercut	5 50 45 30-50° gradie stable for full potent for ma	Sub(2% for low that stress habita colonistial; additions;	Optim  Dow  ams) m  t; well-s  zation  equate I  nce of	Mu Mi	ck- ud arl  10-309 gradie stable availal desiral freque	plai Blac orga G fr.  W GRAD Margin % for low ent streams) habitat; ha bility less th ble; substra ently disturb	nt mater ck very fi anic mat rey, she agments  DINET S  nal  mix of bitat han hate	TREAN 10% fo low gra stable habitat substra	dient s nabitat; is obvi	Poo	r Sistematical states of the s	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable	r than 5 gradien strate fan nal color ver; mix rged log cobble	50% Int stream Int stream Introduction Intro	H/ ms) e for a & gs, ercut er	5 50 45 30-500 gradie stable for full potent for ma popula additio	Sub( % for lo nt streat habita colonia cial; additions; conal su	Optimow  ams) m  t; well-s  zation  equate I  nce of  presence	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	plai Blac orga G fr.  W GRAD Margin % for low ent streams) habitat; ha bility less th ble; substra ently disturb	nt mater ck very fi anic mat rey, she agments  DINET S  nal  mix of bitat han hate	TREAN 10% fo low gra stable habitat substra	dient s nabitat; is obvi	Poo	r Sistematical states of the s	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allov	r than 5 gradien strate fa nal color ver; mix rged log cobble	50%  Int stream  I	ms) e for i & gs, ercut er	5 50 45 30-50° gradie stable for full potent for ma popula addition form of the stable	Sub( % for lo nt streat habita colonia cial; additions; conal su	Optimow  ams) m  t; well-s  zation  equate I  nce of  presence  bstrate  all, but r	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	plai Blac orga G fr.  W GRAD Margin % for low ent streams) habitat; ha bility less th ble; substra ently disturb	nt mater ck very fi anic mat rey, she agments  DINET S  nal  mix of bitat han hate	TREAN 10% fo low gra stable habitat substra	dient s nabitat; is obvi	Poo	r Sistematical states of the s	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti	r than 5 gradien strate far nal color ver; mix rged log cobble habitat &	50%  Int stream  I	ms) e for a & ercut er age on ags	550045  ABITA 30-500 gradie stable for full potent for ma popula addition form of yet pro	Sub( % for lo that stream habita colonia tial; additions; onal sub of newfa	Optimow  ams) m  t; well-s  zation  equate I  nce of  presence  bstrate  all, but r	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	plai Blac orga G fr.  W GRAD Margin % for low ent streams) habitat; ha bility less th ble; substra ently disturb	nt mater ck very fi anic mat rey, she agments  DINET S  nal  mix of bitat han hate	TREAN 10% fo low gra stable habitat substra	dient s nabitat; is obvi	Poo	r Sistematical states of the s	eacii
Boulder Cobble Gravel Sand Silt Clay  Hall Para  1. Epifaut Substrat Available Cover	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal e/	Greate for low of subsepifaur fish consubme banks, stable to allow potentithat are	r than 5 gradien strate far al color ver; mix rged log cobble habitat & v full col al (i.e., l	50%  Int stream  I	ms) e for a & ercut er age on ags	55045 ABITA 30-500 gradie stable for full potent for ma popula addition form of yet pro-	Sub( % for lo that stream habita colonia tial; additions; onal sub of newfa	Optimow  ams) m  t; well-s  zation  equate I  nce of  presence  bstrate  all, but r  for  (may ra	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	plai Blac orga G fr.  W GRAD Margin % for low ent streams) habitat; ha bility less th ble; substra ently disturb	nt mater ck very fi anic mat rey, she agments  DINET S  nal  mix of bitat han hate	TREAN 10% fo low gra stable habitat substra	dient s nabitat; is obvi te uns	Poo tream: ; lack c ous; table c	r Sistematical states and the states are states and the states are	eacii
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti that are not trai	r than 5 gradien strate far all color ver; mix rged log cobble habitat & v full col all (i.e., le not ne nsient).	50%  Int stream  I	ms) e for a & ercut er age on ags and	550045  ABITA 30-5000 gradie stable for full potent for ma popula addition form of yet pre colonii high e	Sub( % for lo that stree habita colonia tial; ade tintenan ations; onal su of newfa epared zation	Dptim  Dw  ams) m  t; well-s  zation  equate I  nce of  presend  bstrate  all, but r  for  (may ra  cale).	Mu Mu Ma	ck- ud arl  10-309 gradie stable availat desira freque remov	plai Blac orga G fr. W GRAD Margin % for low ent streams) habitat; ha bility less th ble; substra ently disturb red.	nt mater ck very fi anic mat rey, she agments  DINET S  nal  mix of bitat han hate	TREAN 10% fo low gra stable habitat substra	dient s nabitat; is obvi te uns	Poo tream: ; lack c ous; table c	r Sistematical states and the states are states and the states are	1 (

2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: no
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged
	mats and submerged vegetation.
	vegetation common. vegetation present.
Score 6	
·	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small
	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.
	small-deep pools present. few shallow pools.
Score 3	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4.Sediment	Little and a large description of the state
	Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine
Deposition	of islands or point bars bar formation, mostly new gravel, sand or fine material, increased bar
	and less than <20% of from gravel, sand or fine sediment on old and new development; more than
	the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom
	sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools
	deposition in pools. deposits at obstructions, almost absent due to
	constrictions, and bends; substantial sediment
	moderate deposition of deposition.
Coore 47	pools prevalent.
Score 17	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
5. Channel Flow	Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in
Status	both lower banks, and available channel; or available channel, and/or channel and mostly
	mimimal amount of <25% of channel riffle substrates are present as standing pools.
	channel substrate is substrate is exposed. mostly exposed.
	exposed.
Score 5	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6. Channel	Channelization or Some channelization Channelization may be Banks shored with gabion
Alteration	dredging absent or present, usually in areas extensive; embankments or cement; over 80% of
Alteration	minimal; stream of bridge abutments; or shoring structures the stream reach
	with normal evidence of past present on both banks; channelized and disrupted.
	pattern. channelization, i.e., and 40 to 80% of stream Instream habitat greatly
	present, but recent
	channelization is not
Score 16	
Score 10	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

7. Channel		The bends in t	he stream	1	The bends i	n the str	eam	The bends	s in the stre	eam	Channel stra	aight;	
Sinuosity		increase the s	tream		increase the	stream		increase t	he stream		waterway ha	as been	
		length 3 to 4 ti	mes longe	er	length 2 to 3	3 times le	onger	length 1 to	2 times lo	onger	channelized	for a long	g
		than if it was ir	n a straigh	ıt	than if it was	s in a str	aight	than if it w	as in a stra	aight	distance.		
		line. (Note - ch	nannel		line.			line.					
		braiding is con	sidered										
		coastal plains											
		normal low-lyii											
		this parameter	Ū										
		easily rated in											
		areas.)											
Score 5			1 🗆	П		пг			1 I I				$\neg$ $\neg$
00010		20 19 1	<u></u> 8 17	<u>1</u> 6	15 14	13	<u></u> 12 11	10	<u> </u>	<u> </u>	6 5 4	<u></u>	2 1
		20 19 1	0 17	10	13 14	13	12 13	. 10	9 0		0 3 <del>4</del>		2 1
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderatel	y unstable	; 30-	Unstable; ma	any erod	ed areas;
(score each ban	k)	of erosion or b	ank failure	е	infrequent, s	small are	eas of	60% of ba	nk in reacl	h has	"raw" areas	frequently	y along
Note: determine left	or	absent or mini	mal; little		erosion mos	stly heale	ed	areas of e	rosion; hig	h	straight sect	ions and	bends;
right side by facing		potential for fu	ture		over. 5-30%	of bank	in		tential dur		obvious ban		
downstream.		problems. <5%			reach has a			floods.		J	60-100% of	ŭ	0.
· · · ·		affected.			erosion.						erosional sc		
Score (LB)	4			$\neg$		П	$\Box$	$\vdash$	<b>V</b>				$\neg$
000.0 (22)	_	Left Bank	10	9	8	7	6	<del></del>	4	3	2	1	
Score (RB)	4	Left bank		Ť	<del></del>		$\overline{\Box}$		<u> </u>	$\overline{\Box}$		<del></del>	$\overline{\Box}$
Score (IVD)	4	Diaht Dank	<u> </u>	9	<u> </u>	<u> </u>	<u>Ц</u>	<u></u>	<u>쌑</u>	3	<u></u>	<u> </u>	Ш
		Right Bank	10	9	0		- 0	<u> </u>	4	3			
9. Vegetative		More than 90%	% of the		70-90% of the	he strea	m-	50-70% of	the strear	m-	Less than 50	0% of the	
Protection (sco	ore	streambank su	ırfaces an	d	-bank surfac	ces cove	red	bank surfa	aces cover	ed	streambank	surfaces	
each bank)		immediate ripa	arian zone	s	by native ve	getation	, but	by vegeta	tion; disrup	otion	covered by v	/egetatio	n;
Note: determine left	or	covered by na			one class of	•			atches of		disruption of	•	
right side by facing		vegetation, inc			not well repr				sely croppe		vegetation is		
downstream.		trees, understo	•		disruption e				common;		vegetation h		,
downstream.		or nonwoody	Jiy Siliubs	ο,	affecting full			than one-l		1033	removed to	as Deen	
		macrophytes;	voaststive		•					lo.		o or loop	in
			Ū	,	potential to				lant stubb	ie	5 centimeter		
		disruption thro			extent; more			height rem	naining.		average stul	obie neig	nt.
		grazing or mov	•		half of the p								
		minimal or not			stubble heig	tht rema	ining.						
		almost all plan	ts allowed	t									
		to grow natura	ılly.										
Score (LB)	1											$\overline{\checkmark}$	
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	1											$\checkmark$	
		Right Bank	10	9	8	7	6	5	4	3	2	1	
10. Riparian		Width of riparia	an zone		Width of ripa	arian zoi	ne 12-	Width of ri	parian zon	ne 6-	Width of ripa	arian zone	2 < 6
Vegstative Zor	10	>18 meters; h			18 meters; h		.0 .2	12 meters		.0 0	meters: little		
_									•			•	
Width (score ea	acn	activities (i.e.,	-		activities ha				nave impac	cted	vegetation d	ue to hur	nan
bank riparian		lots, roadbeds	, clear-		zone only m	inimally	-	zone a gre	eat deal.		activities.		
zone)		cuts, lawns, or	crops)										
		have not impa	cted zone										
Score (LB)	1											<b>✓</b>	
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	1											<b>V</b>	
-		Right Bank	<u></u> 10	9	8	7	6	5	4	3	2	1	
TOTAL SCORE	67												

Project ID:	Somerville	South An	nendmer	nt 2	Str	eam	Class	:	Ephe	meral			
Stream ID:	#15B				Lo	catio	n:		Mack	ey, IN			
Lat:	38.23142	Long:	-:	87.3615	Riv	er B	asin:		Ohio				
Investigators:	Nate												
Signature:			D	ate:	Ę	5-May	/-2011		Reas	on for Sur	vey:		
Signature.			Т	ime:			5:3	5 PM	404 F	unctional	Asses	sment	
WEATHER		Current			Past 2	24-Ho	urs			Heavy rain	n in las	t 7-day	'S
CONDITIONS		Storm (He	eavy Rain)		Stor	m (Hea	avy Rain	)		NO	✓ Yes	;	
		Rain Stead	dy		Rain	Stead	y			Air Temp	°C	1	18
		Showers (	(Intermitten	t)	Show	wers (I	ntermitt	ent)		Air Temp	°F	(	<b>3</b> 5
		Cloud Cov	ver %		<b>✓</b> Clou	ıd Cove	er %		90	Other:	•		
		✓ Clear/Sun	ny		Clea	ır/Sunn	ıy						
SITE LOCATION	ON/MAP	See Attac	chment										
STREAM		Stream Su	ıbsvsten	า					Strea	ım Type			
CHARACTERI	ZATION	Perennial	-	rmittent	✓En	hemer	al			ldwater			
		_							_	armwater			
		Stream Or	ain								hment	Area	
		Upland Ru	_	[7]	Mixture	of Oria	inc			Mile <sup>2</sup>			.02
		_ `	d/Ground wa		Wetland		Other			Km <sup>2</sup>			).1
							Other						
WATERSHED		Surroundi	ng Land	use & F	Percen	tage		Local	Wate	ershed NP	S Pollu	ıntion	
FEATURES		Forest		☐ Co	mmercia	I		☐ No	eviden	ce So	me poter	ntial sourc	es
		☐ Field/Past	ure	✓ Otl	her		100	<b>✓</b> Ob⁄	vious so	ources Ag.	induc	ed sedi	ment
		Agriculture	е	Logo	<u>led</u>		_	Local	Wate	ershed Ero	sion		
		Residentia	al					Nor	ne 🗸	Moderate	Heav	'y	
RIPARIAN		Indicate th	ne domin	ant tyn	a and r	odor	d tha	domin	ant c	naciae nra	scont		
VEGETATION			Shrubs	Grasse		Herbs		None	iaiit s	phecies big	Sont		
(18 meter buff		Dominant	_				ш'	None					
(10 meter bun	ei)	Dominant	Opecies	. Loge	jeu ioi	CSI							
INSTREAM		Est. Reach	Length		ft	256	m	78		Canopy C	over		
FEATURES		Est. Strear	n Width		ft		m	0.0		<b>✓</b> Open	□ P.	artly Ope	n
		Sampling F			ft <sup>2</sup>	0	$m^2$	0		Shaded	☐ P	artly Shad	dedC
		Sampling A	Area mile	2	mile <sup>2</sup>	0.0	$km^2$	0.0					
		Area in km	2		mile <sup>2</sup>	0.0	$km^2$	0.0		High Water	Mark	ft	0.00
		Est. Water	Depth		in	1.0	m	0.0		High Water	Mark	m	0.00
		Surface Ve	elocity		ft/s	0.2	m/s	0.1		% of Stream	n Morph	ology	
			-						Riff	fle %	Rur	า %	
		Channelize	ed 🗌 Yes	✓ No	)				Poo			de Pool	
		Dam Prese	_	_					=	p Pool Series			
LARGE WOOD	Y	LWD 0	.9 m²	1	0 f	t²							
DEBRIS				_									
		Density of	LWD	m²/k	m²	0.00	00009	290		ft <sup>2</sup> /mile <sup>2</sup>	0.	000000	3587

AQUATIO	С		Indic	cate	the	dom	inant	type	and re	ecord th	ne dor	minant	spec	ies pr	eser	nt					
VEGETA	TION			ooted		•				nergent	_	Rooted		•	□N	one					
			Fr	ree Flo	oatin	g	_	' Atta	ched Alg	jae		Floatin	g Alga	е							
			Porti	ion c	of the	e rea	ach w	ith a	quatic	vegeta	tion pi	resent					25	%			
WATER	QUALITY		рН	ducti Il Dis	ivity ssolv		13 µs/cr Solids			o °F 146.7 mg/l		ter Odo Normal/N Chemical	lone		wage naerob	_	Pe	etrole	eum		
			Turb ☑cı ☐o	•			ght Tui	·bid	□ Tu	rbid		<b>ter Sur</b> Slick [ Other	face Shee	_	Glo	bs		Flec	ks		
SEDIMEI SUBSTR			Odo	o <b>rs</b> Norm Chem	al nical		☐ Sew ☐ Ana	-		Petroleum None		Depo	lge [		dust Othe		aper	fibe	r [	□ Sa	and
			Oils ☑ A	Absent	t [	☐ Sli			/loderate	e 🔲 F	Profuse		dded	, are i □ Yes	unde	erside	es b	olac No	k in	col	
	ORGANIC											GANIC									
Substrate	Diame	ter	%	Co	mpc		inSa	ampl	ing	Subst		С	hara	cteris	stic	'			•		on in
Type						Rea	arn			Ty	ne						<b>5</b> 3	mn	แทย	Kea	
Bedrock							2011			1	_	Stick	'S \M(	ond c	nare			۳			ach
Bedrock Boulder	>10"									Deti	_			ood, c		е	<u> </u>	···· <b>P</b>		, , , , ,	acn
Boulder	>10" 2.5 - 1						2011			1	ritus	р	lant r	nateri	ial	е	<u> </u>				acn
	>10" 2.5 - 1 0.1 - 2	0"					0			Deti	ritus ck-	p Bl	lant r lack v	materi /ery fi	ial ne	е					acn_
Boulder Cobble	2.5 - 1	0" .5"				1				Deti	ritus ck- ud	p Bl	lant r lack v rgani	nateri	ial ne ter	е					acn
Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" 5"				1 2	0			Deti Mu Mi	ritus ck- ud	p Bl	lant r lack v rgani Grey	materi /ery fi c mat	ial ne ter	е					acn
Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2 gritty	0" 5" ,				1 2	0			Deti Mu Mi	ritus ck- ud	p Bl	lant r lack v rgani Grey	materi very fi c mat v, shel	ial ne ter	е					acn
Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe	0" 5" ,				1 2 7	0 0 0	AT AS	SSESS	Deti Mu Mi	ck- ud arl	BI OI	lant r lack v rgani Grey fragi	materi very fi c mat r, shel ments	ial ne ter II						acn
Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick	0" 5" ,	Opt	tima	11	1 2 7	0 0 0		SSESS	Mu Mi Mi	ck- ud arl	BI OI	lant r lack v rgani Grey fragi	materi very fi c mat r, shel ments	ial ne ter II			Poo			acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" ,				1 2 7	0 0 0	Sub	Optim	Mu Mi Mi	ck- ud arl	P Bl OI	lant r lack v rgani Grey fragi ADIN jinal	materi very fi c mat r, shel ments	ial ne ter II	AMS					acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y	er than gradie	50% ent str	reams	1 2 7 HA	0 0 0 30-50° gradie	Sub % for l	Optimow ams) m	Mu Mu Mi Ma SMENT al	ck- ud arl	W GRA Marg	lant r lack v rgani Grey fragi ADIN jinal	materi very fi c matt r, shel ments ET S1	ial ne ter ll s	AMS for gradie	i)	Poo	or ns)		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y	er than gradie strate f	50% ent sti favora	ream:	11 22 77 HA	0 0 0 30-500 gradie stable	Sub % for l nt stre habita	Optimow ow ams) m	Mu Mu Mi Ma SMENT al	ck- ud arl	W GRA Marg % for low nt strear habitat;	lant relact verganice Grey frage ADIN ginal version michael habita	materi very fi c matt r, shel ments ET S1	rREA	for gradie hab	ent si	Poor tream lack	or ns)		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur	er than gradie strate f	50% ent str favora oniza	reams able fo	11 22 77 HA	0 0 0 30-50° gradie stable	Sub % for l nt stre habita colon	Optimow ams) mat; well-stization	Mu Mi	ck- ud arl	W GRA Marg % for low nt strear habitat;	lant relack verganic Grey frage frage ADIN jinal verse habita	materi very fi c matt r, shel ments ET S1	TREA  low (stable habit	AMS for gradie habitat is o	ent si	Poolitrean lack	or of		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish co	er than gradie strate f nal col- ver; m	50% ent str favora oniza ix of s	reams able for tion &	11 22 77 HA	0 0 0 30-500 gradie stable for full	Sub % for lent stree habita colon ial; ad	Optimow ams) m at; well-s ization equate	Mu Mi	ck- ud arl  10-309 gradie stable availal desiral	W GRA Marg % for low nt strear habitat; bility less ble; subs	lant relack verganice Grey frage frage ADIN ginal version mixtures than estrate	materi very fi c matr r, shel ments ET Si	rreference in a control of the contr	AMS for gradie le hab tat is o	ent si	Poolitrean lack	or of		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme	er than gradie strate f nal col- ver; m	50% ent str favora oniza ix of s ogs, u	reams able for tion & snags	11 22 77 HA	0 0 0 30-500 gradie stable for full potent	Sub % for I nt stre habita colon ial; ad intena	Optimow ams) m at; well-s ization equate in	Mu Mi Mi SMENT al	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Marg % for low nt strear habitat; bility less ble; subs	lant relack verganice Grey frage frage ADIN ginal version mixtures than estrate	materi very fi c matr r, shel ments ET Si	TREA  low (stable habit	AMS for gradie le hab tat is o	ent si	Poolitrean lack	or of		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish cor subme banks,	er than gradie strate f nal cole ver; m erged lo	50% ent str favora oniza ix of s ogs, u e or o	reams able for tion 8 snags under	11 22 77 HA	0 0 0 30-500 gradie stable for full potent for ma	Subo % for I nt stree habita colon ial; ad intena ations;	Optimow ams) m at; well-s ization equate l nce of presence	Mu Mi	ck- ud arl  10-309 gradie stable availal desiral	W GRA Marg % for low nt strear habitat; bility less ble; subs	lant relack verganice Grey frage frage ADIN ginal version mixtures than estrate	materi very fi c matr r, shel ments ET Si	rreference in a control of the contr	AMS for gradie le hab tat is o	ent si	Poolitrean lack	or of		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme	er than gradie strate f nal cole ver; m gradie cobble	50% ent strifavora oniza ix of sogs, ue or out & at	reams able for tion 8 snags under other	1 2 7 HA	0 0 0 30-500 gradie stable for full potent for ma popula additio	Sub % for I nt stre habita colon ial; ad intena ations; onal su	Optimow ams) mat; well-sization equate ince of present	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Marg % for low nt strear habitat; bility less ble; subs	lant relack verganice Grey frage frage ADIN ginal version mixtures than estrate	materi very fi c matr r, shel ments ET Si	rreference in a control of the contr	AMS for gradie le hab tat is o	ent si	Poolitrean lack	or of		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable	er than gradie strate f hal cole ver; m gradie cobble habita	50% ent strand s	reams able for tion & snags under other stage zation	1 2 7 HA	0 0 0 30-500 gradie stable for full potent for ma popula additio	Sub % for I nt stre habita colon ial; ad intena ations; onal su f newf	Optimow ams) m at; well-s ization equate l nce of presence abstrate all, but i	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Marg % for low nt strear habitat; bility less ble; subs	lant relack verganice Grey frage frage ADIN ginal version mixtures than estrate	materi very fi c matr r, shel ments ET Si	rreference in a control of the contr	AMS for gradie le hab tat is o	ent si	Poolitrean lack	or of		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allov	er than gradie strate f nal cole ver; m gradie cobble habita w full c	50% ent strand favora onizarix of soogs, under the attention of the attent	reams able for tion 8 snags under other stage zation	11 27 7 HA ss) or & ss, ccut	0 0 0 30-500 gradie stable for full potent for ma popula addition form of	% for I habita colon ial; ad intena ations; onal su	Optimow ams) m at; well-s ization equate l nce of presence abstrate all, but i	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Marg % for low nt strear habitat; bility less ble; subs	lant relack verganice Grey frage frage ADIN ginal version mixtures than estrate	materi very fi c matr r, shel ments ET Si	rreference in a control of the contr	AMS for gradie le hab tat is o	ent si	Poolitrean lack	or of		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal e/	Greate for low of subsepifaur fish consubanks, stable to allow potenti	er than gradie strate f hal cole ver; m gradie cobble habita w full c ial (i.e.	50% ent strand favora onization onization onization on onization on onization on onization on onization on onization	reams able for tion 8 snags under other stage zation	11 27 7 HA ss) or & ss, ccut	0 0 0 30-500 gradie stable for full potent for ma popula addition form of	% for I habita colon ial; ad intena ations; onal suff newfepared zation	Optimow ams) m at; well-s ization equate l nce of present bstrate all, but i for (may ra	Mu Mu Ma	ck- ud arl  10-309 gradie stable availal desiral freque	W GRA Marg % for low nt strear habitat; bility less ble; subs	lant relack verganice Grey frage frage ADIN ginal version mixtures than estrate	materi very fi c matr r, shel ments ET Si	rreference in a control of the contr	AMS for gradie le hab tat is o	ent si	Poolitrean lack	or of		acn
Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaul Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti that are not trai	er than r gradie strate f nal cole ver; m rged le cobble habita w full c ial (i.e. e not r nsient)	50% ent strand favora onization onization onization on onization on onization on onization on onization on onization	reams able for tion 8 snags under other stage zation	11 27 7 HA ss) or & ss, ccut	O O O O O O O O O O O O O O O O O O O	% for I habita colon ial; ad intena ations; onal suff newfepared zation	Optimow ams) m at; well-s ization equate   nce of presence all, but it for (may ra scale).	Mu Mu Ma	ck- ud arl  10-309 gradie stable availat desira freque remov	W GRAMA Margo Mont stream habitat; bility less ble; subsently distred.	lant relack verganice Grey frage frage ADIN ginal version mixtures than estrate	materi very fi c matr r, shel ments ET Si	rreference in a control of the contr	AMS for gradie le hab tat is o	ent si	Poolitrean lack	or or		1 (

2. Pool	Mixture of substrate M	lixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no
Substrate	materials, with gravel and	r clay; mud may be	bottom: little or no root	root mat or vegetation.
Characterization	firm sand prevalent; root de	ominant; some root mats	mat: no submerged	
	mats and submerged a	nd submerged	vegetation.	
	vegetation common.	egetation present.		
Score 6				
•	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small
			more prevalent than deep	shallow or pools absent.
			pools.	·
Score 1		<u> </u>		
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0
4.Sediment	Little or no enlargement S	ome new increase in	Moderate deposition of	Heavy deposits of fine
Deposition	of islands or point bars b	par formation, mostly	new gravel, sand or fine	material, increased bar
	and less than <20% of from	om gravel, sand or fine	sediment on old and new	development; more than
	the bottom affected by	ediment; 20-50% of the	bars; 50-80% of the	80% of the bottom
	sediment deposition.	ottom affected; slight	bottom affected; sediment	changing frequently; pools
	de	eposition in pools.	deposits at obstructions,	almost absent due to
			constrictions, and bends;	substantial sediment
			moderate deposition of	deposition.
			pools prevalent.	
Score 17				
·	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0
5. Channel Flow	Weter reaches been of	later fills . 750/ of the	Weter fille OF 750/ of the	Vone little weter in
Status			Water fills 25-75% of the	Very little water in
Status	·	·	available channel, and/or	channel and mostly
			riffle substrates are	present as standing pools.
		ubstrate is exposed.	mostly exposed.	
Saara 4	exposed.	<del>  </del>		
Score 4	20 10 10 17 16	15 14 12 12 11		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0
6. Channel	Channelization or S	ome channelization	Channelization may be	Banks shored with gabion
Alteration	dredging absent or pr	resent, usually in areas	extensive; embankments	or cement; over 80% of
	minimal; stream of	f bridge abutments;	or shoring structures	the stream reach
	with normal e	vidence of past	present on both banks;	channelized and disrupted.
	pattern. ch	hannelization, i.e.,	and 40 to 80% of stream	Instream habitat greatly
	dı	redging, (greater than	reach channelized and	altered or removed
			disrupted.	entirely.
	ומ .	resent, but recent	•	
	l '	hannelization is not		
		resent.		
Score 13				
<u> </u>	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0
L				

7. Channel		The bends in t	the stream	n	The bends i	n the str	eam	The bends	in the stre	eam	Channel stra	aight;	
Sinuosity		increase the s	tream		increase the	stream		increase th	e stream		waterway ha	is been	
		length 3 to 4 ti	imes longe	er	length 2 to 3	3 times lo	onger	length 1 to	2 times lo	nger	channelized	for a long	g
		than if it was i	n a straigh	nt	than if it was	s in a str	aight	than if it wa	s in a stra	aight	distance.		
		line. (Note - ch	nannel		line.			line.					
		braiding is cor	nsidered										
		coastal plains											
		normal low-lyi											
		this parameter	Ū										
		easily rated in											
		areas.)	11000										
Score 6	•			П				<del></del>		7 🔽		пп	$\neg$ $\neg$
00010		20 19 1	8 17	<u>1</u>	15 14	13	<u></u> 12 11	10	9 8	<u> </u>	6 5 4	<u> </u>	2 1
		20 19 1	.6 17	10	13 14	13	12 11	1 10	9 0		0 3 <del>4</del>	·	2 1
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable	; 30-	Unstable; ma	any erod	ed areas;
(score each ban	k)	of erosion or b	ank failur	е	infrequent, s	small are	eas of	60% of bar	nk in reach	n has	"raw" areas	frequently	y along
Note: determine left	or	absent or mini	imal; little		erosion mos	stly heale	ed	areas of er	osion; hig	h	straight sect	ions and	bends;
right side by facing		potential for fu	ıture		over. 5-30%	of bank	in	erosion pot	_		obvious ban		
downstream.		problems. <5%			reach has a			floods.		J	60-100% of	ŭ	<b>O</b> .
· · · ·		affected.			erosion.						erosional sc		
Score (LB)	8			$\neg$	<u> </u>			$\vdash$	$\neg$				
000.0 (22)		Left Bank	10	9	8	7	6	<u></u>	4	3	2	1	
Score (RB)	8	Left bank		Ť	<u> </u>	<del></del>	$\overline{\Box}$		$\overline{}$	$\overline{\Box}$		<del></del>	
Score (IVD)	0	Diab+ Donk	<u> </u>	9	<u> </u>	7	<u>Ц</u>	<u> </u>	<u> </u>	3	<u></u>	 1	
		Right Bank	10	9	0		- 0	<u> </u>	4				
9. Vegetative		More than 90%	% of the		70-90% of t	he streai	m-	50-70% of	the strear	n-	Less than 50	0% of the	
Protection (sco	ore	streambank si	urfaces ar	nd	-bank surfac	ces cove	red	bank surfa	ces cover	ed	streambank	surfaces	
each bank)		immediate ripa	arian zone	es	by native ve	getation	, but	by vegetati	on; disrup	tion	covered by v	/egetatio	n;
Note: determine left	or	covered by na			one class of	•		obvious; pa			disruption of	•	
right side by facing		vegetation, inc			not well rep	•		soil or clos			vegetation is		
downstream.		trees, underst	•	2	disruption e			vegetation			vegetation h		,
downstream.		or nonwoody	ory Siliubs	э,	affecting full			than one-h	-	1033	removed to	as been	
		macrophytes;	voqototiv	_	•					10		o or loop	in
			Ū	<del>5</del>	potential to			potential pl		e	5 centimeter		
		disruption thro			extent; more			height rema	aining.		average stul	obie neig	nt.
		grazing or mo	•		half of the p								
		minimal or not			stubble heig	ght remai	ınıng.						
		almost all plar		b									
		to grow natura	ally.										
Score (LB)	4					Ц			V	$\Box$			
1		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	4								V				
		Right Bank	10	9	8	7	6	5	4	3	2	1	
10. Riparian		Width of ripari	on 7000		Width of ripa	orion zor	20.12	Width of rip	orion zon	6	Width of ripa	rion zon	2 46
-					-		16 12-			l <del>e</del> 0-	•		
Vegstative Zor		>18 meters; h			18 meters; h			12 meters;			meters: little	•	
Width (score ea	ach	activities (i.e.,	parking		activities ha	ve impa	cted	activities ha	ave impac	ted	vegetation d	ue to hur	man
bank riparian		lots, roadbeds	, clear-		zone only m	ninimally.		zone a gre	at deal.		activities.		
zone)		cuts, lawns, or	r crops)										
		have not impa	cted zone	<b>)</b> .									
Score (LB)	1											$\checkmark$	
` ,		Left Bank	10	9	_ <u></u>	<u> </u>	<u></u>	_ <u></u> 	4	_ <u></u>		1	
Score (RB)	1		<u> </u>	$\overline{\Box}$	$\overline{}$	$\overline{\Box}$	$\overline{\Box}$	$\overline{\Box}$	$\overline{\Box}$	$\overline{\Box}$	$\overline{\Box}$	$\overline{\mathbf{V}}$	
` '	-	Right Bank	<u></u> 10	9	8	7	6	5	4		2	1	
TOTAL SCORE	78	_					-						
. U I / L UUUNL													

Project ID:	Somerville	e South Am	endment	2	Str	ream	Class	:	Ephe	meral			
Stream ID:	#16				Lo	catio	n:		Mack	key, IN			
Lat:	38.23076	Long:	-87.	36165	Riv	ver B	asin:		Ohio				
Investigators:	Nate												
Signature:			Da			5-May	/-2011			on for Sur			
Oignatare.			Tin	ne:			5:3	9 PM	404 F	unctional	Asses	sment	
<u>-</u>		_			•								
WEATHER		Current			Past 2	24-Hc	urs			Heavy rain		_	/S
CONDITIONS		Storm (Hea	•		Stor	rm (He	avy Rain	1)		NO	✓ Yes		
		Rain Stead	•		Rair		-			Air Temp <sup>°</sup>			18
		Showers (I	-				ntermitt	ent)		Air Temp '	°F		65
		Cloud Cove			☑ Clou				90	Other:			
		✓ Clear/Sunn	у		Clea	ar/Sunr	ıy						
SITE LOCATION	ON/MAP	See Attac	hment										
STREAM		Stream Sul	nsvstem						Stres	ım Type			
CHARACTER	IZATION	Perennial	Intern	nittent	√Fr	ohemer	al			ldwater			
					<b>—</b> -r		<b></b>		_	armwater			
		Stream Org	nin								hment	Area	
		Upland Rur			Mixture	of Orio	ins			Mile <sup>2</sup>		0	.03
		Spring-fed/			Wetland	_	Other			Km <sup>2</sup>		C	).1
							0 1.10.	_					
WATERSHED		Surroundir	ig Land u			_		_		ershed NP			
FEATURES		Forest			mmercia	ıl	400	_	eviden		•	ntial sour	
		Field/Pastu	re	☑ Otl			100	☑ Ob		_		ed sedi	iment
		Agriculture		Logo	<u>jea</u>		_	_		ershed Ero	_		
		Residential						No	ne <u>L</u> ✓	Moderate	Heav	'y	
RIPARIAN		Indicate the	e domina	nt typ	e and	redor	d the	domir	nant s	species pre	esent		
VEGETATION		☐ Trees ☐	Shrubs	Grasse	es 🗸	Herbs		None					
(18 meter buff	fer)	Dominant S	Species:	Logg	ged for	est							
INSTREAM		Est. Reach	Lenath		ft	503	m	153		Canopy Co	over		
FEATURES		Est. Stream	•		ft		m	0.0		Open		artly Ope	n
		Sampling R	each Area	a	$ft^2$	0	$m^2$	0		Shaded		artly Shad	
		Sampling A			$mile^2$	0.0	$km^2$	0.0			_	<i>y</i>	
		Area in km <sup>2</sup>			$mile^2$	0.0	$km^2$	0.0		High Water	Mark	ft	0.00
		Est. Water I	Depth		in	0.5	m	0.0		High Water		m	0.00
		Surface Vel			ft/s	0.1	m/s	0.0		% of Stream	n Morph	ology	
			-						Rif	fle %	Rui		
		Channelized	d ∐ <sub>Yes</sub>	✓ No	)					ol %		de Pool	
		Dam Presei		✓ No					=	p Pool Series			
LARGE WOOD	Υ	LWD 0.9		1	0	ft <sup>2</sup>							
DEBRIS				2	2					. 2 2	_		
		Density of	LWD	m²/k	m <sup>²</sup>	0.00	00009	290		ft <sup>2</sup> /mile <sup>2</sup>	0.	000000	3587

AQUATIO	С		Indic	ate t	he d	domi	inant	type	and re	ecord th	ne dor	ninant	spe	cies	pre	sen	t					
VEGETA	TION		<b>✓</b> Ro	oted	Emer	gent		Root	ed Subr	nergent		Rooted	d Floa	iting		No	one					
			☐ Fre	ee Flo	ating	I		Attac	ched Alg	jae		Floatin	ng Alg	ae								
			Porti	on o	f the	e rea	ch w	ith ad	quatic	vegeta	tion p	resent					Г	20	%			
WATER	QUALITY		Tem	nera	ture		14	°C	57	'°F	Wa	ter Od	ors									
WAILK	QUALITI		Conc	•			μs/cn		51	90.3	7	lormal/N		П	Sew	ane	Г	□Pe	trole	ıım		
					•		Solids		66	mg/l		Chemical				agc erob	_		tioic	um		
			рН	7.8										_			-					
			Turbi	iditv							Wa	ter Sui	rface	e Oils								
			Cle	•	✓	Slic	ht Tur	bid	□Tu	rbid	_	_	Sh		_	Glob	os		Fleck	S		
			_	oague			ined		Otl			Other										
SEDIMEI	NT/		Odoı	rs								Depo	sits									
SUBSTR	ATE		<b>✓</b> N	Norma	al		Sew	age	□F	etroleum	1	Sluc	dge	Sa	wdu	ust	□Р	aper	fiber	. [	Sa	nd
				Chemi	ical		Ana	erobic		None		Reli	ic She	ells [		Other						
				Other																		
												Looki	_									
			Oils		_	_		_		_		embe	edde			nde	rside			(in	colc	or?
		2112		bsent	_	Sli	_		/loderate	e 📙 l	Profuse			<u> </u>								
	IORGANIC								•	0		GANIC										•
Substrate Type	Diame	er	%	Cor	-	Site	inSa	ımpıı	ing	Subst Ty			nar	acter	IST	IC	`			•		n in
l lybe																						ch
										_	-	Sticl	ks w	/ood	CO	arse	9	-	··· •	8	INC	ıch
Bedrock	>10"									_	ritus			vood, mate			Э	-	<u> </u>	<u>a</u>	itea	ich
	>10" 2.5 - 1									Det	-	ŗ	olant	vood, mate very	eria	l	Э				inca	ich
Bedrock Boulder		0"				1(				Det	ritus	p B	olant Ilack	mate	eria fine	e e	Э				ive a	ich
Bedrock Boulder Cobble	2.5 - 1	0" 5"					0			Deti Mu Mi	ritus ck-	p B	olant Ilack organ	mate very	eria fine atte	e e	е					ich
Bedrock Boulder Cobble Gravel Sand Silt	2.5 - 1 0.1 - 2.	0" 5"				1(	0			Deti Mu Mi	ritus ck- ud	p B	olant Ilack organ Gre	mate very nic ma	eria fine atte	e e	е				inca	ich
Bedrock Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2 gritty	0" 5" y				10	0			Deti Mu Mi	ritus ck- ud	p B	olant Ilack organ Gre	mate very nic ma y, sh	eria fine atte	e e	Э					ich
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe	0" 5" y				1( 1) 7)	0 5 5	T AS	SSESS	Deti Mu Mi	ck- ud arl	B O	olant Ilack organ Gre fraç	mate very nic ma y, shagmen	fine atte ell ts	e er						nch
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hal	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter	0" 5" y	Opt	tima		1( 1) 7)	0 5 5		SSESS Optim	Mu Mu Mi	ck- ud arl	B O	olant dack organ Gre fraç	mate very nic ma ey, sh gmen	fine atte ell ts	e er			Poo			ich
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y	r than	50%		10 15 75 HA	0 5 5 <b>BITA</b>	Sub( 6 for lo	<b>Optim</b> ow	Mu Mi Mi	ck- ud arl	B O O O O O O O O O O O O O O O O O O O	olant slack organ Gre frac ADIN gina	very very nic ma ey, she gmen	fine atte ell ts	l e er RE <i>F</i>	AMS		Poo	or		ich
Bedrock Boulder Cobble Gravel Sand Silt Clay Hal Para 1. Epifaul Substrat	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y Greate	r than	50% ent stre	<b>I</b>	10 11 75 <b>HA</b>	0 5 5 <b>BITA</b> 30-50% gradier	Sub( 6 for lo	Optim ow ams) m	Mu Mi Mi SMENT al	ck- ud arl	W GRA Març % for lov	olant dack organ Gre frac ADIN gina	mate very nic ma ey, she gmen	fine atte ell ts	e er	AMS	ent st	Poo	er s)		ich
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5"  Greate for low of subs	r than s gradie strate fa	50% ent stre avora	l eams ble fo	1( 1) 7! HA	0 5 5 BITA 30-50% gradier stable	Sub( 6 for long the strection of the str	Optim ow ams) m	Mu Mi Mi SMENT al	ck- ud arl	W GRA Marg % for low	olant black organ Gre frag ADIN gina w ms) m	mate very nic ma ey, sha gmen	find atte ell ts	REA	AMS for gradie	ent st	Poo ream	er s)	Nea	ich
Bedrock Boulder Cobble Gravel Sand Silt Clay Hal Para 1. Epifaul Substrat	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur	gradie gradie strate fa	50% ent stre avoral onizat	l eams ble fo ion &	10 19 75 <b>HA</b>	0 5 5 30-50% gradier stable for full	Sub( 6 for long that stre habita coloni	Optimow ams) m at; well-s	Mu Mi Mi SMENT al	ck- ud arl  10-30 gradie stable availal	W GRA Març % for low nt strean habitat; billity les	blant black black brgan Gre frag ADIN wms) m habit	mate very nic may, showing men	findatte ell ts	eer REA 10% ow g	AMS  for irradie e hab at is o	ent st	Poc ream lack uus;	s)	Nea	ich
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O" 5"  Greate for low of subsepifaur fish company to the company t	gradie gradie strate fa nal colo ver; mi	50% ent streavoral onization	eams ble fo ion & nags,	10 15 75 HA	0 5 5 30-50% gradier stable for full potenti	Sub( 6 for lont streent streen	Optimow ams) m at; well-s zation equate	Mu Mi Mi SMENT al	ck- ud arl	W GRA Marg % for lov nt streat habitat; bility les	olant organ Green frage ADIN wms) ms) ms habit s thar	mate very nic mate y, she gmen	fine atte ell ts	eerrerrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr	AMS  for a radie e hab	ent st	Poc ream lack uus;	s)	Nea	ich
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O" 5"  Greate for low of subs epifaur fish cor subme	gradie gradie strate fa nal colo ver; miz	50% ent streavoral avoral onizati ix of s	eams ble fo ion & nags,	10 11 79 HA	0 5 5 30-50% gradier stable for full potenti	Subtempt Sub	Optimow ams) m at; well-s zation equate a	Mu Mi Mi SMENT al	ck- ud arl  10-30 gradie stable availal desira freque	W GRA Marg % for low not stream habitat; billity less ble; sub	olant lack organ Gre frag  ADIN w ms) m habit s thar	mate very nic mate y, she gmen	fine atte ell ts	eer REA 10% ow g	AMS  for a radie e hab	ent st	Poc ream lack uus;	s)	Nea	nch
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish cor subme banks,	gradie gradie strate fa nal colc ver; mi: rged lo cobble	50% ent streamoral avoral anizationization ix of sings, under or of	eams ble fo ion & nags, nderc	1(1) 15 HA	0 5 5 30-50% gradier stable for full potenti for mai	Subtement streethabitations;	Optimow ams) m at; well-s zation equate l nce of	Mu Mi	ck- ud arl	W GRA Marg % for low not stream habitat; billity less ble; sub	olant lack organ Gre frag  ADIN w ms) m habit s thar	mate very nic mate y, she gmen	fine atte ell ts	eerrerrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr	AMS  for a radie e hab	ent st	Poo	s)	Nea a	nch
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O" 5"  Greate for low of subs epifaur fish cor subme	gradie gradie strate fa nal colo ver; mix rged lo cobble habitat	50% ent stream avoral conization ix of singes, under or of t & at a	eams ble fo ion & nags, nderc ther	1(1) 7: HA	0 5 5 30-50% gradier stable for full potenti for mai popula additio	Subtempt streethabital colonial; additions; nal su	Optimow ams) m at; well-s zation equate a	Mu Mi Mi Mi Mi ix of suited mabitat the of in	ck- ud arl  10-30 gradie stable availal desira freque	W GRA Marg % for low not stream habitat; billity less ble; sub	olant lack organ Gre frag  ADIN w ms) m habit s thar	mate very nic mate y, she gmen	fine atte ell ts	eerrerrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr	AMS  for a radie e hab	ent st	Poo	s)	Nea a	nch
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable	gradie gradie strate fa nal colo ver; miz rged lo cobble habitat v full co	50% ent stre avoral onizati ix of si ogs, ui e or of t & at :	eams ble fo ion & nags, nderc ther stage	10 11 79 <b>HA</b>	0 5 5 30-50% gradier stable for full potenti for mai popula additio	Subtempt street habital colonial; addital tions; and subtempt subt	Optimow ams) m at; well-s zation equate l nce of presence bstrate all, but i	Mu Mi Mi Mi Mi ix of suited mabitat the of in	ck- ud arl  10-30 gradie stable availal desira freque	W GRA Marg % for low not stream habitat; billity less ble; sub	olant lack organ Gre frag  ADIN w ms) m habit s thar	mate very nic mate y, she gmen	fine atte ell ts	eerrerrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr	AMS  for a radie e hab	ent st	Poo	s)	Nea	nch
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allov	er than a gradie strate fa nal colo ver; mix rged lo cobble habitat v full co al (i.e.,	50% ent stre avoral conizati ix of si ogs, ui e or of t & at : oloniz , logs/	eams; ble fo ion & nags, nderc ther stage	10 11 75 HA	0 5 5 30-50% gradier stable for full potenti for mai popula additio form of	Subtempt Sub	Optimow ams) m at; well-s zation equate l nce of presence bstrate all, but i	Mu Mi	ck- ud arl  10-30 gradie stable availal desira freque	W GRA Marg % for low not stream habitat; billity less ble; sub	olant lack organ Gre frag  ADIN w ms) m habit s thar	mate very nic mate y, she gmen	fine atte ell ts	eerrerrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr	AMS  for a radie e hab	ent st	Poo	s)	Nea a	nch
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti	gradie gradie strate fa nal colc ver; mi rged lo cobble habitat v full cc al (i.e.,	50% ent stream tonization stre	eams; ble fo ion & nags, nderc ther stage	HA	0 5 5 30-50% gradier stable for full potenti for mai popula additio form of	Subtempt street habital colonial; additations; nal subtempt street habital sub	Optimow ams) m at; well-s zation equate l nce of present bstrate all, but i l for (may ra	Mu Mi	ck- ud arl  10-30 gradie stable availal desira freque	W GRA Marg % for low not stream habitat; billity less ble; sub	olant lack organ Gre frag  ADIN w ms) m habit s thar	mate very nic mate y, she gmen	fine atte ell ts	eerrerrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr	AMS  for a radie e hab	ent st	Poo	s)	inca a	nch
Bedrock Boulder Cobble Gravel Sand Silt Clay Hall Para 1. Epifaut Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greate for low of subsepifaur fish consubanks, stable to allow potenti that are not trai	gradie gradie strate fa nal colo ver; mi: rged lo cobble habitat v full co al (i.e., e not ne	50% ent strt avoral conizati x of s. cogs, ui e or ot t & at : coloniz , logs/	eams; ble fo ion & nags, nderc ther stage	HA	O 5 5 30-50% gradier stable for full potenti for mai additio form of yet pre coloniz high er	Subtempt street habital colonial; additations; nal subtempt street habital sub	Optimow ams) m at; well-s zation equate   nce of presence bstrate all, but n for (may ra scale).	Mu Mi	ck- ud arl  10-30 gradie stable availal desira freque remov	W GR. Marc % for low not stream habitat; bility les ble; sub ently dist ed.	olant lack organ Gre frag  ADIN w ms) m habit s thar	mate very nic mate y, she gmen	fine atte ell ts	REA	AMS  for a radie e hab	ent st	Poc ream lack ous;	ss) oof	2	1 (

2. Pool Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: a bottom: little or no root root mat or vegetation.	
Substrate Imaterials, with gravel and lor clay; mud may be bottom; little or no root loot mat or vegetation.	10
1	
Characterization   firm sand prevalent; root   dominant; some root mats   mat: no submerged	
mats and submerged and submerged vegetation.	
vegetation common. vegetation present.	
Score   6	
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2	1 0
3. Pool Variability Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small	
large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.	
small-deep pools present. few shallow pools.	
Score 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2	1 0
4.Sediment Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine	
Depositionof islands or point barsbar formation, mostlynew gravel, sand or finematerial, increased bar	
and less than <20% of from gravel, sand or fine sediment on old and new development; more than	
the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom	
sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools	
deposition in pools. deposits at obstructions, almost absent due to	
constrictions, and bends; substantial sediment	
moderate deposition of deposition.	
pools prevalent.	
Score   16	
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2	1 0
5. Channel Flow Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in	
Status   both lower banks, and   available channel; or   available channel, and/or   channel and mostly	
mimimal amount of <25% of channel riffle substrates are present as standing pools.	
channel substrate is substrate is exposed.	
exposed.	$\dashv$
exposed.	1 0
Exposed.   Score   3	1 0
Score 3	1 0
Score 3	1 0
exposed.  Score  3	1 0
Score 3	1 0
Exposed.  Score  3	1 0
Score  3	1 0
Score 3	1 0
Score 3	1 0

7. Channel		The bends in t	he stream	1	The bends in	n the str	eam	The bends	in the stre	am	Channel stra	aight;	
Sinuosity		increase the st	ream		increase the	stream		increase th	e stream		waterway ha	is been	
		length 3 to 4 til	mes longe	er	length 2 to 3	times lo	nger	length 1 to	2 times lo	nger	channelized	for a long	g
		than if it was ir	n a straigh	t	than if it was	in a str	aight	than if it wa	ıs in a stra	ight	distance.		
		line. (Note - ch	annel		line.			line.					
		braiding is con	sidered										
		coastal plains											
		normal low-lyir											
		this parameter	Ū										
		easily rated in											
		areas.)											
Score 6	1		1 —	П		пг	1 🗆			7 🔽		пп	$\neg$ $\neg$
00010   0		20 19 1	<u> </u>	<u>16</u>	15 14	13	<u></u> 12 11	 . 10	9 8	<u></u> 7	6 5 4	<u> </u>	2 1
		20 19 1	0 17	10	13 14	13	12 11	. 10 I	9 0		U J 4	·	2 1
8. Bank Stabili	ty	Banks stable;	evidence		Moderately s	stable;		Moderately	unstable;	30-	Unstable; ma	any erod	ed areas;
(score each ban	k)	of erosion or b	ank failure	Э	infrequent, s	mall are	as of	60% of bar	ık in reach	has	"raw" areas	frequently	y along
Note: determine left	or	absent or mini	mal; little		erosion mos	tly heale	ed	areas of er	osion; high	1	straight sect	ions and	bends;
right side by facing		potential for fu	ture		over. 5-30%	of bank	in	erosion pot	_		obvious ban		
downstream.		problems. <5%			reach has ar			floods.		J	60-100% of	ŭ	0.
		affected.			erosion.						erosional sc		
Score (LB)	8			╗	<u> </u>	П	П	$\overline{}$	$\overline{}$	$\overline{}$			$\neg$
000.0 (25)		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	8	Left Balik		÷	<u> </u>	<del>_</del>	$\overline{}$			$\overline{\Box}$		<del></del>	
Score (ND)	0	Dight Donk	<u> </u>	<u> </u>	8	<u> </u>	<u>ц</u> 6	<u></u>	4	<u> </u>	<u></u>	 1	
		Right Bank 1	10	э Т	0		0	J I	4		<u> </u>		
9. Vegetative		More than 90%	6 of the		70-90% of th	ne strear	n-	50-70% of	the stream	<b>)-</b>	Less than 50	0% of the	
Protection (sco	ore	streambank su	ırfaces an	d	-bank surfac	es cove	red	bank surfac	ces covere	ed	streambank	surfaces	
each bank)		immediate ripa	rian zone	s	by native ve	getation	, but	by vegetati	on; disrupt	ion	covered by v	/egetatio	n;
Note: determine left	or	covered by nat			one class of	•		obvious; pa			disruption of	•	
right side by facing		vegetation, inc			not well repr	•		soil or close			vegetation is		
downstream.		trees, understo	•		disruption ev			vegetation			vegetation h		, ,
downstream.		or nonwoody	ny siliubs		affecting full			than one-h	•	C33	removed to	as been	
		macrophytes;	vo gototivo		•							o or loop	in
			Ū		potential to a			potential pl		3	5 centimeter		
		disruption thro			extent; more			height rema	aining.		average stul	obie neig	nt.
		grazing or mov	•		half of the po								
		minimal or not	-		stubble heig	ht remai	ning.						
		almost all plan	ts allowed	l									
<u> </u>		to grow natura	lly.										
Score (LB)	4								$\overline{\checkmark}$				
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	4								$\overline{\vee}$				
		Right Bank 1	10	9	8	7	6	5	4	3	2	1	
10. Riparian		Width of riparia	an zone		Width of ripa	arian zor	ne 12-	Width of rip	arian zone	- 6-	Width of ripa	rian zone	- 6
Vegstative Zor	10	>18 meters; hu			18 meters; h		.0 .2	12 meters;			meters: little		
_												•	
Width (score ea	acn	activities (i.e.,	_		activities hav			activities ha		ed	vegetation d	ue to hur	nan
bank riparian		lots, roadbeds,	, clear-		zone only m	inimally.		zone a grea	at deal.		activities.		
zone)		cuts, lawns, or	crops)										
		have not impa	cted zone					<u> </u>					
Score (LB)	1											<b>✓</b>	
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	1										П	<b>V</b>	
. ,		Right Bank 1	<u></u>	9	8	7	6	5	4	3	2	1	_
TOTAL SCORE	74												

Project ID:	Somerville	South An	nendme	nt 2	Stream Class:					Intermittent					
Stream ID:	#17				Lo	catio	n:		Mack	ey, IN					
Lat:	38.23737	Long:	-8	87.35481	Riv	ver B	asin:		Ohio						
Investigators:	Raj, Josh														
Signature:			1	Date:	;	5-May	/-2011		Reas	on for Surv	ey:				
Signature.			•	Time:			3:2	20 PM	404 F	unctional A	Asses	sment			
WEATHER		Current			Past 2	24-Ho	urs			Heavy rain	in las	t 7-day	s		
CONDITIONS		Storm (H	eavy Rain)		Stor	rm (Hea	avy Rair	1)		□NO	<b>✓</b> Yes	i			
		Rain Stea	dy		Rair	n Stead	ly			Air Temp °	С	1	8		
		Showers	(Intermitte	ent)	Sho	wers (I	ntermit	tent)		Air Temp °	F	6	<b>3</b> 5		
		Cloud Cov	ver %		<b>✓</b> Clou	ud Cove	er %		90	Other:					
		☑ Clear/Sur	nny		Clea	ar/Sunr	ny								
SITE LOCATION	ON/MAP	See Atta	chment		<u> </u>										
CTDE ANA		Chrosen C	ıbayata	<b></b>					C4	m Tura					
STREAM CHARACTERI	ZATION	Stream Su	-		Пг					ım Type					
CHARACTERI	ZATION	Perenniai	<b>V</b> In	termittent	LJ E	ohemer	aı			ldwater					
		Ctroom O							✓ W	armwater		A ====			
		Stream O	_		1					Mile <sup>2</sup>	ment		22		
		Upland R		_	Mixture					Km <sup>2</sup>		_	.6		
		Spring-fe	d/Ground \	water	Wetland	j []	Other			KIII		U	.0		
WATERSHED		Surround	ing Lan	d use & l	Percen	tage		Loca	l Wate	ershed NPS	Pollu	ıntion			
FEATURES		✓ Forest	1	<b>0%</b> □ cc	mmercia	ıl		□No	eviden	ce Son	ne poter	ntial sourc	es		
		Field/Past	ture	Ot	her			<b>✓</b> Ob	vious so	ources Ag. i	induc	ed sedi	ment		
		✓ Agricultur	re <b>9</b>	0%				Loca	l Wate	ershed Eros	sion				
		Residentia	al					☐ Noi	ne 🔽	Moderate	Heav	у			
RIPARIAN		Indicate ti	he domi	nant tyn	e and	redor	d the	domir	nant s	species pre	sent				
VEGETATION		Trees		Grass		Herbs	_	None	iuiii c	proice pro-	JOI11				
(18 meter buff		Dominant	_				_								
Ì	.,														
INSTREAM		Est. Reach				828	m			Canopy Co	ver				
FEATURES		Est. Stream			ft		m	0.0		Open		artly Oper			
		Sampling			ft <sup>2</sup>	0	m <sup>2</sup>	0		Shaded	<b>✓</b> Pa	artly Shad	ledC		
		Sampling A		e²	mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0							
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water N	Mark	ft	0.00		
		Est. Water	•		in	5.0	m	0.1		High Water N	Mark	m	0.00		
		Surface Ve	elocity		ft/s	0.2	m/s	0.1		% of Stream	Morph	ology			
									Rif	fle %	Rur	า %			
		Channelize	_						Po	ol %	Glio	le Pool			
		Dam Pres	ent ∏ <sub>Y€</sub>	es 🔽 No	)				Ste	ep Pool Series					
LARGE WOOD	Υ	LWD_0	).0 m	n²	0 1	ft <sup>2</sup>									
		Density o	f LWD	m²/k	m <sup>2</sup>	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	0.	000000	0000		

VEGETA  WATER	TION	E E T C T	Rooted Rooted Free Floortion of the Conduction o	Emergent pating of the resture evity solved	ach wi	Rooted Attache th aqua C	Submed Algaratic v	ergent ne /egetat	tion W ⊡	□ R □ FI	loote loatin sent Od mal/l	d Floang Alg	ating pae	Se	wage	Non		<b>5</b>	<b>%</b> roleu	m		
			urbidity ] Clear ] Opague	✓ Sli	ght Turk ained	bid [	Turk			Slic Oth	:k	Sh		_	Glo	bs		□ F	lecks			
SEDIMEN SUBSTR		o	odors Norma Chem Other	ical	☐ Sewa	•	□ Pe	etroleum one			Slu Rel	osits  Idge  Iic She  Iing a	□ ells atst	cone	Othe	er hic	h a	re r	not c	lee <sub>l</sub>		
			✓ Absent		•		derate	□P						Yes				No				
l	ORGANIC									RGA						С	1					
Substrate	Diamet	ter	% Coı	mposite		mpling	g	Subst		е	(	Char	act	eris	tic				-			n in
Type				Re	ach			Tyl		٠ ,	Otio.	۱. م. ا	:20	٦ ٥	- 0 ro		-	San	npli	ng I	Rea	ich
Bedrock Boulder	>10"							Detr	ใโนธ	\$   <b>`</b>		ks, w				se						
Cobble	2.5 - 10							Mud	∩k-	+		olant Black										
Gravel	0.1 - 2.				20			Mu				organ		-								
Sand	gritty				50			Ma		+		Gre					<u> </u>					
Silt	gooey				20			==					•	ents								
Clay	slick			1	0																	
Hak	oitat			H/	ABITA	T ASS	ESS	MENT	- L	.OW	GR	ADII	NE.	ΓSΊ	RE	A۱	/IS					
Para	meter		Optima	I	;	SubOp	otima	al		N	Mar	gina	I					P	001			
1. Epifaur	nal	Greater t	han 50%		30-50%	6 for low			10-	30% f	or lo	w			10%	6 fo	r					
Substrat	e/	for low gr	adient str	reams)	gradien	nt stream	ns) mix	cof	gra	dient	strea	ıms) n	nix c	of	low	gra	dien	t stre	eams	s)		
Available	•	of substra	ate favora	ble for	stable h	habitat; v	well-su	uited	stat	ble ha	bitat	; habit	tat		stab	ole h	nabit	at; la	ack o	f		
Cover		epifaunal			for full o	colonizat	tion		ava	ilabilit	ty les	s thar	n		habi	itat	is ob	oviou	ıs;			
			r; mix of s	•		al; adequ				sirable								nstal	ble o	r		
		submerg	_			ntenance				quently	•	turbec	d or		lack	ing	•					
			obble or o			tions; pre			rem	noved.												
		stable ha		•		nal subst <sup>:</sup> newfall,																
		potential				pared for		οι														
		that are r		•		ation (ma		e at														
		not transi	ent).			nd of scal	-															
Score	8											<b>✓</b>										
		20 19	9 18	17 16	15	14 1	L3 1	L2 11		10	9	8		7	6	5		4	3	2		1 0

	T T T T T T T T T T T T T T T T T T T
2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: no
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged
	mats and submerged vegetation.
	vegetation common. vegetation present.
Score 7	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small
	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.
	small-deep pools present. few shallow pools.
Score 9	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4.Sediment	Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine
Deposition	of islands or point bars bar formation, mostly new gravel, sand or fine material, increased bar
	and less than <20% of from gravel, sand or fine sediment on old and new development; more than
	the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom
	sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools
	deposition in pools. deposits at obstructions, almost absent due to
	constrictions, and bends; substantial sediment
	moderate deposition of deposition.
	pools prevalent.
Score 12	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
5. Channel Flow	Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in
Status	
Status	both lower banks, and available channel; or available channel, and/or channel and mostly with lower banks, and available channel; or available channel, and/or channel and mostly riffle substrates are present as standing pools.
	channel substrate is substrate is exposed. mostly exposed.
Score 14	exposed.
Score 14	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6. Channel	Channelization or Some channelization Channelization may be Banks shored with gabion
Alteration	dredging absent or present, usually in areas extensive; embankments or cement; over 80% of
	minimal; stream of bridge abutments; or shoring structures the stream reach
	with normal evidence of past present on both banks; channelized and disrupted.
	pattern. channelization, i.e., and 40 to 80% of stream Instream habitat greatly
	dredging, (greater than reach channelized and altered or removed
	past 20 yr) may be disrupted. entirely.
	present, but recent
	channelization is not
	present.
Score 12	
	<u> </u>

7. Channel		The bends in t	he stream	n	The bends i	n the str	eam	The bends i	n the strea	m	Channel stra	ight;	
Sinuosity		increase the s	tream		increase the	stream		increase the	stream		waterway ha	s been	
		length 3 to 4 ti	mes long	er	length 2 to 3	3 times lo	onger	length 1 to 2	times Ion	ger	channelized	for a long	g
		than if it was in	n a straigh	nt	than if it was	s in a str	aight	than if it was	s in a straiç	ght	distance.		
		line. (Note - ch	nannel		line.			line.					
		braiding is cor	sidered										
		coastal plains											
		normal low-lyin											
		this parameter	Ū										
		easily rated in											
		areas.)											
Score 6	`			П			<del></del>						$\neg$ $\neg$
00010		20 19 1	<u>.                                    </u>	<u>1</u>	15 14	13	<u></u> 12 11	. 10	<u> </u>	<u>」                                    </u>	6 5 4	<u>— —</u> З	2 1
		20 19 1	.0 17	10	13 14	13	12 11	. 10 S	0		0 3 <del>4</del>		2 1
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable; 3	30-	Unstable; ma	any erod	ed areas;
(score each ban	ık)	of erosion or b	ank failur	е	infrequent, s	small are	as of	60% of bank	k in reach l	nas	"raw" areas t	frequently	y along
Note: determine left	or	absent or mini	mal; little		erosion mos			areas of ero	sion; high		straight secti	ions and	bends;
right side by facing		potential for fu			over. 5-30%	of bank	in	erosion pote	_	a	obvious banl		
downstream.		problems. <5%			reach has a			floods.		_	60-100% of l	Ū	0.
· · · ·		affected.			erosion.						erosional sca		
Score (LB)	5			$\neg$			П	<u> </u>	$\overline{}$	$\overline{\Box}$			$\neg$
000.0 (22)		Left Bank	10	9	8	7	6	<u> </u>	4	3	2	1	
Score (RB)	5	LCTC DUTIK		Ť		<del></del>	$\overline{}$	<u> </u>		Ť		一	
Score (IVD)		Diah+ Dank	<u> </u>	9	<u> </u>	7	<u>Ц</u>	<u> </u>	<u> </u>	<u> </u>	<u></u>	<u> </u>	Ш
		Right Bank	10	9	0		0	J I	4		<u>_</u>		
9. Vegetative		More than 90%	% of the		70-90% of tl	he streai	m-	50-70% of tl	ne stream-		Less than 50	% of the	
Protection (sco	ore	streambank su	urfaces ar	nd	-bank surfac	ces cove	red	bank surfac	es covered	ı	streambank	surfaces	
each bank)		immediate ripa	arian zone	es	by native ve	getation	, but	by vegetation	n; disrupti	on	covered by v	egetatio	n;
Note: determine left	or	covered by na	tive		one class of	f plants is	s not	obvious; pat	ches of ba	ıre	disruption of	streamb	ank
right side by facing		vegetation, inc			not well rep	•		soil or close			vegetation is		
downstream.		trees, underst	•		disruption e			vegetation of			vegetation h		,
downou cam.		or nonwoody	ory ormab.	٠,	affecting full			than one-ha	•	,00	removed to	do been	
		macrophytes;	voqotativ	_	potential to			potential pla			5 centimeter	e or loce	in
		. ,	ŭ	<del>-</del>									
		disruption thro			extent; more			height rema	iriirig.		average stub	bble fleig	iit.
		grazing or mo	•		half of the p								
		minimal or not			stubble heig	int remai	ining.						
		almost all plan		d									
		to grow natura	ılly.					<u> </u>					
Score (LB)	4			<u>_</u>	_Ц	<u>Ц</u> _	Ц_	_Ц	<u> </u>	Ц_			
<u> </u>		Left Bank	10	9	8		6	5	4	3	2	1_	
Score (RB)	3		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	Ш
		Right Bank	10	9	8	7	6	5	4	3	2	1	
10. Riparian		Width of ripari	an zone		Width of ripa	arian zor	ne 12-	Width of ripa	arian zone	6-	Width of ripa	rian zone	e <6
Vegstative Zor	ne	>18 meters; h			18 meters; h			12 meters; h		_	meters: little		
_												•	
Width (score ea	acn	activities (i.e.,	-		activities ha			activities ha		ed	vegetation d	ue to hur	nan
bank riparian		lots, roadbeds	, clear-		zone only m	ninimally.		zone a grea	t deal.		activities.		
zone)		cuts, lawns, or	r crops)										
		have not impa	cted zone	)									
Score (LB)	2												
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	1												
		Right Bank	10	9	8	7	6	5	4	3	2	1	
TOTAL SCORE	88												

Project ID:	Somerville	e South Am	nendment	2	Stream Class:				Ephemeral				
Stream ID:	#17A 38.23733 Long: -87.3				Lo	catio	n:		Mack	key, IN			
Lat:	38.23733	Long:	-87.3	35475	Riv	er B	asin:		Ohio	ı			
Investigators:	Josh Iddin	gs, Rajesh	Poudel										
Signature:			Dat	te:		5-May	/-2011			on for Sur			
Oigilatare.			Tim	ne:			3:2	28 PM	404 F	unctional	Asses	sment	
		•								1			
WEATHER		Current			Past 2	24-Ho	urs			Heavy raii		-	'S
CONDITIONS		Storm (He	-				avy Rair	۱)		□NO	✓ Yes		
		Rain Stead	-		Rair		,			Air Temp			18
		Showers (	-				ntermit	tent)		Air Temp	°F		35
		Cloud Cov			✓ Clou				90	Other:			
		✓ Clear/Sun	ny		Clea	ır/Sunn	ıy						
SITE LOCATION	ON/MAP	See Attac	chment										
STREAM		Stream Su	-		_					am Type			
CHARACTER	IZATION	Perennial	☐ Interm	nittent	<b>✓</b> Ep	hemer	al		_	ldwater			
									∠ W	armwater		_	
		Stream Or	•	_							hment		0.4
		Upland Ru			Mixture	_				Mile <sup>2</sup>		_	.01
		Spring-fed	d/Ground wate	er	Wetland	Ш	Other			Km²		U	0.0
WATERSHED		Surroundi	ng Land u	se & F	Percen	tage		Loca	l Wat	ershed NP	S Pollu	untion	
FEATURES		Forest		Со	mmercia	ı		□No	eviden	ce So	me potei	ntial sourc	ces
		Field/Past	ure	Oth	ner			<b>✓</b> Ob	vious s	ources Ag.	induc	ed sedi	ment
		✓ Agriculture	e <b>100</b> %	, D				Loca	l Wat	ershed Erc	sion		
		Residentia	al					☐ No	ne 🔽	' Moderate	Heav	/y	
RIPARIAN		Indicate th	no domina	nt tyn	n and i	rodor	d tha	domii	nant c	enaciae ar	seont		
VEGETATION		Trees		Grasse		Herbs		None	iaiit s	species pre	SSEIIL		
(18 meter buff		_	Species:	_			_						
,							, a.g						
INSTREAM			Length		ft	49	m	15		Canopy C			
FEATURES		Est. Strear			ft		m	0.0		Open		artly Ope	
		Sampling F			ft <sup>2</sup>	0	m <sup>2</sup>	0		Shaded	□P	artly Shad	dedC
		Sampling A			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0					
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water		ft	0.00
		Est. Water	•		in		m	0.0		High Water		m	0.00
		Surface Ve	elocity		ft/s	n/a	m/s	####		% of Stream	n Morph	ology	
				_					Rif	fle %	Ru	n %	
		Channelize	_	<b>✓</b> No					Po	ol %	Glid	de Pool	
		Dam Prese	ent Nes	✓ No					Ste	ep Pool Series			
LARGE WOOD DEBRIS	Y	LWD 0	.0 m²		) 1	t²							
		Density of	I WD	m²/kı	m <sup>2</sup>	0 00	າດດດດດ	0000		ft <sup>2</sup> /mile <sup>2</sup>	0	იიიიი	0000

AQUATION VEGETA							ninant species pro		
VEGETA	TION		✓ Rooted Emergen □ Free Floating	t Rooted Subm	•		Rooted Floating  Floating Algae	☐ None	9
			-	_					
			Portion of the re	each with aquatic	/egetat	tion pr	resent		10 %
WATER (	QUALITY Vater Prese	ent	Temperature Conductivity Total Dissolved pH	#### °C n/a µs/cm Solids	°F mg/l	□N	ter Odors  lormal/None Sec	wage aerobic	Petroleum
			Turbidity			Wat	ter Surface Oils		
				ight Turbid 🔲 Tur	bid	_		Globs	Flecks
			Opague St	ained Oth	er		Other		
SEDIMEN SUBSTR			Odors  Normal Chemical Other	Sewage Po			Other		
			Oils				Looking at stone		n are not deeply ides black in color?
			✓ Absent S	light Moderate	□Р	Profuse	Yes		□ No
IN	ORGANIC	SUBS	STRATE COMP	<u> </u>		ORG	SANIC SUBSTRA	ATE C	OMPONENTS
Substrate	Diamet	er	% Composit	e inSampling	Subst	rate	Characteris	tic	% Composition in
Type			Re	each	Ty	pe			Sampling Reach
Bedrock					Detr	itus	Sticks, wood, co		
Boulder	>10"	0.11					plant materi	al	
Boulder Cobble	2.5 - 10				Mu	ck-	plant materi Black very fir	al ne	
Boulder Cobble Gravel	2.5 - 10 0.1 - 2.	5"		40	Mu Mu	ck- ud	plant materi Black very fir organic matt	al ne er	
Boulder Cobble Gravel Sand	2.5 - 10 0.1 - 2. gritty	5"		40	Mu	ck- ud	plant materi Black very fir organic matt Grey, shell	al ne er	
Boulder Cobble Gravel	2.5 - 10 0.1 - 2.	5"		40 50	Mu Mu	ck- ud	plant materi Black very fir organic matt	al ne er	
Boulder Cobble Gravel Sand Silt Clay	2.5 - 10 0.1 - 2. gritty gooey slick	5"		50 10	Mu Mu Ma	ck- ud arl	plant materi Black very fir organic matt Grey, shell fragments	al ne er	18
Boulder Cobble Gravel Sand Silt Clay	2.5 - 10 0.1 - 2. gritty gooey	5"	H.	50	Mu Mt Ma	ck- ud arl	plant materion Black very fire organic matted Grey, shell fragments	al ne er	1S Poor
Boulder Cobble Gravel Sand Silt Clay	2.5 - 10 0.1 - 2. gritty gooey slick bitat meter	5" /		50 10 ABITAT ASSESS	Mu Mt Ma	ck- ud arl	plant materi Black very fir organic matt Grey, shell fragments	al ne er	Poor
Boulder Cobble Gravel Sand Silt Clay Hat	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter nal	5" / Greate	H. Optimal	50 10 ABITAT ASSESS SubOptima	Mu Mu Ma MENT	ck- ud arl - LOV	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal	re er FREAN	Poor
Boulder Cobble Gravel Sand Silt Clay  Hab Parar  1. Epifaur	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	5" / Greate	HA Optimal or than 50%	ABITAT ASSESS SubOptima 30-50% for low	Mu Ma Ma MENT	ck- ud arl - LOV 10-30% gradier	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal % for low nt streams) mix of	REAN	Poor
Boulder Cobble Gravel Sand Silt Clay  Hab Parar 1. Epifaur Substrate	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	5" / Greate for low of subs	Hand Optimal or than 50% gradient streams)	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix	Mu Ma Ma MENT	ck- ud arl - LOV 10-30% gradier stable	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal % for low nt streams) mix of habitat; habitat	REAN 10% for low grastable h	Poor r dient streams)
Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	/ Greate for low of subsepifaur	HA Optimal er than 50% gradient streams) strate favorable for	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix stable habitat; well-su	Muc Ma MENT al	ck- ud arl - LOV 10-30% gradier stable availab	plant materic Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than	REAM 10% for low grastable habitat	Poor dient streams) habitat; lack of
Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	Greate for low of subsepifaur fish consubme	HAD Optimal or than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, urged logs, undercut	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-su for full colonization	Muc Ma MENT al	ck- ud arl 10-30% gradiet stable availab desirat	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal % for low nt streams) mix of habitat; habitat bile; substrate	REAM 10% for low grastable habitat	Poor  dient streams) habitat; lack of is obvious; te unstable or
Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	Greate for low of subs epifaur fish cor subme banks,	Optimal  or than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, rged logs, undercut cobble or other	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence	Muc Mu Ma	ck- ud arl 10-30% gradiet stable availab desirat	plant materic Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or
Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	Greate for low of subsepifaur fish cosubme banks, stable	HAD Optimal  For than 50%  Gradient streams)  Strate favorable for the colonization & the colonization with th	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix stable habitat; well-so for full colonization potential; adequate h for maintenance of populations; presence additional substrate i	Muc Muc Ma	ck- ud arl 10-30% gradiel stable availab desirat frequen	plant materic Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or
Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	Greate for low of subsepifaur fish consubme banks, stable to allow	Optimal or than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage w full colonization	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n	Muc Muc Ma	ck- ud arl 10-30% gradiel stable availab desirat frequen	plant materic Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or
Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	Greate for low of subsepifaur fish consubanks, stable to allow potenti	HAD Optimal  In than 50% In gradient streams) In that streams of the formulation & the formulation with the formulation with the formulation with the formulation of	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for	Muc Mu Ma	ck- ud arl 10-30% gradiel stable availab desirat frequen	plant materic Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or
Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	Greate for low of subsepifaur fish consubme banks, stable to allow potentithat are	HAD Optimal  For than 50%  gradient streams)  Strate favorable for the colonization & the colonization with the colonization with the colonization with the colonization with the colonization and (i.e., logs/snags enot new fall and	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix stable habitat; well-so for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for colonization (may rat	Muc Mu Ma	ck- ud arl 10-30% gradiel stable availab desirat frequen	plant materic Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or
Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	Greate for low of subsepifaur fish consubme banks, stable to allow potentithat are	HAD Optimal  In than 50% In gradient streams) In that streams of the formulation & the formulation with the formulation with the formulation with the formulation of	ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for	Muc Mu Ma	ck- ud arl 10-30% gradiel stable availab desirat frequen	plant materic Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or

	T	Т	ı						
2. Pool	Mixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no					
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.					
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged						
	mats and submerged	and submerged	vegetation.						
	vegetation common.	vegetation present.							
Score 6									
•	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0					
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small					
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.					
	small-deep pools present.	few shallow	pools.	·					
Score 1			<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>						
	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0					
	20 13 10 1, 10		1	T					
4.Sediment	Little or no enlargement	Some new increase in	Moderate deposition of	Heavy deposits of fine					
Deposition	of islands or point bars	bar formation, mostly	new gravel, sand or fine	material, increased bar					
	and less than <20% of	from gravel, sand or fine	sediment on old and new	development; more than					
	the bottom affected by	sediment; 20-50% of the	bars; 50-80% of the	80% of the bottom					
	sediment deposition.	bottom affected; slight	bottom affected; sediment	changing frequently; pools					
		deposition in pools.	deposits at obstructions,	almost absent due to					
			constrictions, and bends;	substantial sediment					
			moderate deposition of	deposition.					
			pools prevalent.	aoposition.					
Score 16				<u>i                                    </u>					
	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 (					
5. Channel Flow	Water reaches base of	Water fills >75% of the	Water fills 25-75% of the	Very little water in					
Status	both lower banks, and	available channel; or	available channel, and/or	channel and mostly					
	mimimal amount of	<25% of channel	riffle substrates are	present as standing pools.					
	channel substrate is	substrate is exposed.	mostly exposed.	prosent as standing pools.					
		Substrate is exposed.	mostly exposed.						
Score 3	exposed.	<u> </u>							
00010   0	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0					
	20 13 10 17 10	15 14 15 12 11	10 5 6 7	T					
6. Channel	Channelization or	Some channelization	Channelization may be	Banks shored with gabion					
Alteration	dredging absent or	present, usually in areas	extensive; embankments	or cement; over 80% of					
	minimal; stream	of bridge abutments;	or shoring structures	the stream reach					
	with normal	evidence of past	present on both banks;	channelized and disrupted.					
	pattern.	channelization, i.e.,	and 40 to 80% of stream	Instream habitat greatly					
		dredging, (greater than	reach channelized and	altered or removed					
		past 20 yr) may be	disrupted.	entirely.					
		present, but recent							
		channelization is not							
		present.							
Score 16									
	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0					

													1
7. Channel		The bends in t	the strean	n	The bends i	n the sti	ream	The bends	in the stre	eam	Channel stra	aight;	
Sinuosity		increase the s	tream		increase the	stream	ı	increase th	e stream		waterway ha	is been	
		length 3 to 4 ti	mes long	er	length 2 to 3	3 times l	onger	length 1 to	2 times lo	nger	channelized	for a lon	g
		than if it was i	n a straigh	nt	than if it was	s in a sti	raight	than if it wa	s in a stra	aight	distance.		
		line. (Note - ch	nannel		line.			line.					
		braiding is cor	sidered										
		coastal plains	and other										
		normal low-lyi											
		this parameter	•										
		easily rated in											
		areas.)	111000										
Score 6		П Г		П						7 🔽			
00010	,	20 19 1	.8 17	<u>1</u> 6	15 14	13	<u> </u>	 10	<u> </u>	<u>   ⊻-</u> 7	6 5 4	<u> </u>	2 1
		20 19 1	.6 17	10	13 14	13	12 11	1 10	9 0		U J 4	·	2 1
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable	; 30-	Unstable; m	any erod	ed areas;
(score each ban	k)	of erosion or b	ank failur	е	infrequent, s	small are	eas of	60% of bar	ık in reacl	n has	"raw" areas	frequentl	y along
Note: determine left	or	absent or mini	mal; little		erosion mos			areas of er	osion; hig	h	straight sect	ions and	bends;
right side by facing		potential for fu			over. 5-30%	of bank	ς in	erosion pot	_		obvious ban		
downstream.		problems. <5%			reach has a			floods.		J	60-100% of	J	٠ <i>,</i>
- · · · <del>- · · · ·</del>		affected.			erosion.						erosional sc		
Score (LB)	6		$\overline{}$	$\overline{\Box}$			$\Box$	$\vdash$	$\Box$			<u> </u>	$\neg$
000.0 (22)		Left Bank	10	9	8	7	6	<del></del>	4	3	2	1	
Score (RB)	6	LCTC DUTIK		Ť		<del>_</del>			$\overline{\Box}$	$\vec{\Box}$		一	$\neg$
Score (IVD)	0	Diah+ Dank	10	9	<u> </u>	<u> </u>	<u> </u>	<u></u>	<u> </u>	3	<u></u>	1	
		Right Bank	10	9	0		- 0	<u> </u>	4				
9. Vegetative		More than 90%	% of the		70-90% of t	he strea	m-	50-70% of	the strear	n-	Less than 50	0% of the	
Protection (sco	ore	streambank si	urfaces ar	nd	-bank surfac	ces cove	ered	bank surfac	ces cover	ed	streambank	surfaces	
each bank)		immediate ripa	arian zone	es	by native ve	getation	n, but	by vegetati	on; disrup	otion	covered by v	egetatio	n;
Note: determine left	or	covered by na	tive		one class of	f plants i	is not	obvious; pa	tches of l	bare	disruption of	streamb	ank
right side by facing		vegetation, inc			not well rep			soil or close			vegetation is		
downstream.		trees, underst	•	s	disruption e			vegetation			vegetation h		,
downstream.		or nonwoody	ory ormab	٥,	affecting full			than one-h		1000	removed to	45 50011	
		macrophytes;	vegetativ	2	potential to			potential pl		ام	5 centimeter	e or less	in
			-	<del>-</del>						ic			
		disruption thro			extent; more			height rema	allillig.		average stul	ble rieig	rit.
		grazing or mo	•		half of the p		•						
		minimal or not	-		stubble heig	ınt rema	iining.						
		almost all plar		d									
-		to grow natura	ally.					<u> </u>					
Score (LB)	7			<u> </u>		$\overline{\square}$		<u> </u>	Ц	Щ_			
<u> </u>		Left Bank	10	9	8		6	5	4	3	2	1_	
Score (RB)	7			<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>		<u> </u>	
		Right Bank	10	9	8	7	6	5	4	3	2	1	
10. Riparian		Width of ripari	an zone		Width of ripa	arian zo	ne 12-	Width of rip	arian zon	ne 6-	Width of ripa	rian zone	e <6
Vegstative Zor	10	>18 meters; h			18 meters; I			12 meters:			meters: little		
_							-11	·					
Width (score ea	acn	activities (i.e.,	-		activities ha			activities ha		cted	vegetation d	ue to hur	man
bank riparian		lots, roadbeds	, clear-		zone only m	inimally		zone a grea	at deal.		activities.		
zone)		cuts, lawns, or	r crops)										
		have not impa	cted zone	<del>)</del>	<u> </u>			<u>L</u>			<u> </u>		
Score (LB)	2										<b>✓</b>		
•		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	2										<b>V</b>		
-		Right Bank	10	9	8	7	6	5	4	3	2	1	
TOTAL SCORE	79												

Project ID:	Somerville	South An	t 2	Stream Class:				Ephemeral					
Stream ID:	#18				Lo	catio	n:		Mack	cey, IN			
Lat:	38.23788	Long:	-87	.35217	Riv	er B	asin:		Ohio	ı			
Investigators:	Nate Nola	nd											
Signature:			Da	ate:	1	8-Ma	y-201	1	Reas	on for Sur	vey:		
Oigilatare.			Ti	me:			11:3	85 AM	404 F	unctional	Asses	sment	
WEATHER		Current			Past 2	24-Ho	urs			Heavy rair		•	'S
CONDITIONS		Storm (He	eavy Rain)		Stor	m (Hea	avy Rair	۱)		□NO	✓ Yes		
		Rain Stea	-		Rair		-			Air Temp			18
		Showers (	-				ntermit	tent)		Air Temp	°F	•	<u> </u>
		Cloud Cov		20	☑ Clou				90	Other:			
		Clear/Sun	ny		Clea	ır/Sunr	ıy						
SITE LOCATION	ON/MAP	See Atta	chment										
STREAM		Stream Su	-		_					am Type			
CHARACTERI	ZATION	Perennial	☐ Inter	mittent	<b>∠</b> Ep	hemer	al		_	ldwater			
									✓ W	armwater	_	_	
		Stream Or	•								hment		•
		Upland R			Mixture		ins			Mile <sup>2</sup>	•		01
		Spring-fed	d/Ground wa	ter	Wetland		Other			Km²		0	.0
WATERSHED		Surroundi	ing Land	use & F	Percen	tage		Loca	l Wate	ershed NP	S Pollu	ıntion	
FEATURES		✓ Forest	109	<b>%</b> 🔲 со	mmercia	I		□No	eviden	ce So	me poter	ntial sourc	es
		Field/Past	ure	Otl	ner			<b>✓</b> Ob	vious so	ources Ag.	induc	ed sedi	ment
		☑ Agricultur	e <b>90</b>	%				Loca	l Wat	ershed Ero	sion		
		Residentia	al					☐ No	ne 🔽	' Moderate	Heav	/y	
RIPARIAN		Indicate th	ao domin	ant tyn	o and i	rodor	d tha	domii	aant c	species pre	scont		
VEGETATION		Trees		Grasse		Herbs		None	iants	species pre	Seni		
(18 meter buff		Dominant		_	_		_	None					
,	0.,				•								
INSTREAM		Est. Reach				75	m	23		Canopy C	over		
FEATURES		Est. Strear			ft		m	0.0		Open		artly Opei	
		Sampling F			ft <sup>2</sup>	0	m <sup>2</sup>	0		Shaded	<b>✓</b> P	artly Shac	ledC
		Sampling A		-	mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0					
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water		ft	0.00
		Est. Water	•		in		m	0.0		High Water		m	0.00
		Surface Ve	elocity		ft/s	n/a	m/s	####	_	% of Stream			
			. —	_					Rif		Ru		
		Channelize		☑ No					Po		Glid	de Pool	
		Dam Prese	ent Yes	✓ No	ı				St∈	ep Pool Series			
LARGE WOOD	Υ	LWD 0	.5 m²		51	ft <sup>2</sup>							
		Density of	FIWD	m²/kı	m²	0.00	00002	1645		ft <sup>2</sup> /mile <sup>2</sup>	0	იიიიი	1794

VEGETATION       ✓ Rooted Emergent ☐ Rooted Submergent ☐ Rooted Floating ☐ None       ☐ Rooted Emergent ☐ Rooted Floating ☐ None       ☐ Rooted Floating ☐ None         ☐ Free Floating ☐ Attached Algae       ☐ Floating Algae         Portion of the reach with aquatic vegetation present       10 %         WATER QUALITY       Temperature #### °C n/a °F Water Odors       Water Odors         Conductivity μs/cm       ☐ Normal/None ☐ Sewage ☐ Petroleur	
WATER QUALITY Temperature #### °C n/a °F Water Odors	
Conductivity µs/cm ☐ Normal/None ☐ Sewage ☐ Petroleui	
	n
Total Dissolved Solids mg/l Chemical Anaerobic	
No Water Present pH	
Turbidity Water Surface Oils	
☐ Clear ☐ Slight Turbid ☐ Turbid ☐ Slick ☐ Sheen ☐ Globs ☐ Flecks	
Opague Stained Other Other	
SEDIMENT/ Odors Deposits	
SUBSTRATE Sewage Petroleum Sludge Sawdust Paper fiber	Sand
Chemical Anaerobic None Relic Shells Other	
Other	
Looking at stones which are not d	
Oils embedded, are undersides black   ✓ Absent ☐ Slight ☐ Moderate ☐ Profuse ☐ Yes ☐ No	n color?
✓ Absent	Te
	osition in
	g Reach
Bedrock Detritus Sticks, wood, coarse	8
Boulder >10" plant material	
Cobble 2.5 - 10" Muck- Black very fine	
Gravel 0.1 - 2.5" Mud organic matter	
Sand gritty 45 Marl Grey, shell	
Silt gooey 50 fragments	
Clay slick 5	
Habitat HABITAT ASSESSMENT - LOW GRADINET STREAMS	
Parameter Optimal SubOptimal Marginal Poor	
1. Epifaunal Greater than 50% 30-50% for low 10-30% for low 10% for	
Substrate/ for low gradient streams) gradient streams) mix of gradient streams) mix of low gradient streams gradient streams) mix of low gradient streams gradient gradient streams gradient grad	
Available of substrate favorable for stable habitat; well-suited stable habitat; habitat stable habitat; lack of stable habitat; lack of cover epifaunal colonization & for full colonization availability less than habitat is obvious;	
fish cover; mix of snags, potential; adequate habitat desirable; substrate substrate unstable or	
submerged logs, undercut for maintenance of frequently disturbed or lacking.	
banks, cobble or other populations; presence of removed.	
stable habitat & at stage additional substrate in	
to allow full colonization form of newfall, but not	
potential (i.e., logs/snags yet prepared for	
that are not new fall and colonization (may rate at	
that are not new fall and colonization (may rate at not transient). high end of scale).	
that are not new fall and colonization (may rate at	2 1 0

	T T T T T T T T T T T T T T T T T T T
2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: no
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged
	mats and submerged and submerged vegetation.
	vegetation common. vegetation present.
Score 7	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small
	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.
	small-deep pools present. few shallow pools.
Score 1	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4.Sediment	Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine
Deposition	of islands or point bars bar formation, mostly new gravel, sand or fine material, increased bar
	and less than <20% of from gravel, sand or fine sediment on old and new development; more than
	the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom
	sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools
	deposition in pools. deposits at obstructions, almost absent due to
	constrictions, and bends; substantial sediment
	moderate deposition of deposition.
	pools prevalent.
Score 13	
·	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
E Channel Flow	
5. Channel Flow	Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in
Status	both lower banks, and available channel; or available channel, and/or channel and mostly
	mimimal amount of <25% of channel riffle substrates are present as standing pools.
	channel substrate is substrate is exposed. mostly exposed.
0	exposed.
Score 2	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6. Channel	Channelization or Some channelization Channelization may be Banks shored with gabion
Alteration	dredging absent or present, usually in areas extensive; embankments or cement; over 80% of
	minimal; stream of bridge abutments; or shoring structures the stream reach
	with normal evidence of past present on both banks; channelized and disrupted.
	pattern. channelization, i.e., and 40 to 80% of stream Instream habitat greatly
	dredging, (greater than reach channelized and altered or removed
	past 20 yr) may be disrupted. entirely.
	present, but recent
	channelization is not
	present.
Score 16	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
	<u> </u>

												1
7. Channel		The bends in t	he stream	The bend	ds in the str	ream	The bends	in the stre	am	Channel stra	aight;	
Sinuosity		increase the st	ream	increase	the stream	ı	increase th	ne stream		waterway ha	as been	
		length 3 to 4 ti	mes longer	length 2	to 3 times I	onger	length 1 to	2 times lo	nger	channelized	for a long	g
		than if it was ir	n a straight	than if it	was in a str	raight	than if it wa	as in a stra	ight	distance.		
		line. (Note - ch	annel	line.			line.					
		braiding is con	sidered									
		coastal plains										
		normal low-lyir										
		this parameter	•									
		easily rated in										
		areas.)										
Score 6	3	П Г	1	<del>,</del>	1		<del> </del>		7 🔽			$\neg$ $\neg$
00010		20 19 1	<u>1                                    </u>	L6 15 :	<u> </u>	<u> </u>	L 10	9 8	<u> </u>	6 5 4	<u></u>	2 1
		20 19 1	0 17 .	10 13 .	14 13	12 11	T 10	9 0		0 3 <del>4</del>		2 1
8. Bank Stabil	ity	Banks stable;	evidence	Moderate	ely stable;		Moderately	/ unstable;	30-	Unstable; ma	any erod	ed areas;
(score each ban	ık)	of erosion or b	ank failure	infrequer	nt, small are	eas of	60% of bar	nk in reach	has	"raw" areas	frequently	y along
Note: determine left	or	absent or mini	mal; little		nostly heal		areas of er	osion; high	ı	straight sect	ions and	bends;
right side by facing		potential for fu		over. 5-3	0% of bank	ς in	erosion po	_		obvious ban		
downstream.		problems. <5%			s areas of		floods.		J	60-100% of	J	J,
- · · · <del>- · · · ·</del>		affected.		erosion.						erosional sc		
Score (LB)	4			1		$\Box$	<del></del>	<b>7</b>				$\neg$
000.0 (22)	-	Left Bank	10 9	8	7	6		4	3	2	1	
Score (RB)	3	LCTC Barrix		, <u> </u>		$\overline{}$		$\overline{}$	$\overline{\nabla}$		一	
Score (IVD)	3	Dight Donk	<u> </u>	<u>. Ц</u> 8	<u></u>	<u> </u>	<u></u> 5	<u> </u>	3	<u></u>	<u> </u>	Ш
		Right Bank	10 3	· ·		0		-4				
9. Vegetative		More than 90%	6 of the	70-90%	of the strea	m-	50-70% of	the stream	<b>)</b> -	Less than 50	0% of the	
Protection (sc	ore	streambank su	ırfaces and	-bank su	rfaces cove	ered	bank surfa	ces covere	ed	streambank	surfaces	
each bank)		immediate ripa	rian zones	by native	vegetation	n, but	by vegetat	ion; disrup	tion	covered by v	/egetatio	n;
Note: determine left	or	covered by na	tive	one class	s of plants i	is not	obvious; pa	atches of b	are	disruption of	streamb	ank
right side by facing		vegetation, inc			represented		soil or clos			vegetation is		
downstream.		trees, understo	•		n evident b		vegetation			vegetation h		,
downourcam.		or nonwoody	ory ormado,		full plant g		than one-h		1000	removed to	45 50011	
		macrophytes;	voqotativo	1	to any grea		potential p		^	5 centimeter	e or loce	in
			-	ľ					5			
		disruption thro		,	nore than o		height rem	allillig.		average stul	oble fleig	iit.
		grazing or mov	•		e potential	•						
		minimal or not	•	stubble r	neight rema	iining.						
		almost all plan										
	_	to grow natura	lly.									
Score (LB)	3								<b>✓</b>			
		Left Bank	10 9	8	<u>7</u>	<u>6</u>	5	4	3	2	1_	
Score (RB)	2		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	Ц		✓	Ц_	
		Right Bank	10 9	8	7	6	5	4	3	2	1	
10. Riparian		Width of riparia	an zone	Width of	riparian zo	ne 12-	Width of rip	oarian zone	e 6-	Width of ripa	arian zone	e <6
Vegstative Zo	nο	>18 meters; hu			s; human		12 meters:			meters: little		
-		·			•		1					
Width (score e	acn	activities (i.e.,	_		have impa		activities h		ted	vegetation d	ue to hur	nan
bank riparian		lots, roadbeds	, clear-	zone only	y minimally		zone a gre	at deal.		activities.		
zone)		cuts, lawns, or	crops)									
		have not impa	cted zone.									
Score (LB)	5						V					
		Left Bank	10 9	8	7	6	5	4	3	2	1	
Score (RB)	5			] []			V					
		Right Bank	<u> </u>	8	7	6	5	4	3	2	1	
TOTAL SCORE	68											

				· · · · · · · · · · · · · · · · · · ·									
Project ID:	Somerville	e South Am	nendment	t <b>2</b>	Stream Class:				Ephemeral				
Stream ID:	#19				Lo	catio	n:		Mack	cey, IN			
Lat:	38.23728	Long:	-87	.35216	Riv	ver B	asin:		Ohio				
Investigators	Nate Nola	nd							1				
Signature:				ate:	;	5-May	y-2011			on for Surv			
Oignatare.			Tit	me:			1:5	1 PM	404 F	Functional A	Asses	sment	
		_											
WEATHER		Current			Past 2					Heavy rain		-	/S
CONDITIONS		Storm (He	-			-	avy Rair	1)		NO	✓ Yes		
		Rain Stead	-		Rair					Air Temp °			18
		Showers (		)			Intermit	tent)		Air Temp °	'F		65
		Cloud Cov			Clou				90	Other:			
		✓ Clear/Suni	ny		Clea	ar/Sunr	ny						
SITE LOCATION	ON/MAP	See Attac		1									
STREAM		Stream Su	hsystem						Strea	am Type			
CHARACTER	IZATION	Perennial	Inter		√ Fi	ohemer	·al			ldwater			
					<b>—</b> - r		u.						
		Stream Or	ain						✓ Warmwater  Catchment Area				
		Upland Ru	_	☑	Mixture	of Orig	iins		Mile <sup>2</sup> 0.02				
		Spring-fed		_	Wetland	_			Km <sup>2</sup> 0.1				
								_					
WATERSHED	1	Surroundi	_			_		Loca	I Wat	ershed NPS			
FEATURES		Forest		<b>%</b> □ c₀		al		_	eviden		•	ntial sour	
		Field/Pastu		Otl						ources Ag.		ed sed	ıment
		Agriculture		<b>%</b>			_			ershed Ero			
		Residentia	<u>                                     </u>					No	ne L⊻	Moderate	Heav	/y	
RIPARIAN		Indicate th	e domina	ant typ	e and	redor	d the	domii	nant s	species pre	sent		
VEGETATION		☐ Trees ✓	Shrubs	Grasse	es 🗌	Herbs		None					
(18 meter buf	fer)	Dominant	Species:	Soft	mast f	orest	t, ag fi	eld					
INSTREAM		Est. Reach	Lenath		ft	568	m	173		Canopy Co	over		
FEATURES		Est. Strean	_		ft		m	0.0		Open		artly Ope	n
		Sampling F	Reach Are	а	$ft^2$	0	$m^2$	0		Shaded		artly Sha	
		Sampling A			$mile^2$	0.0	$km^2$	0.0				<b>,</b>	
		Area in km	2		$mile^2$	0.0	$km^2$	0.0		High Water I	Mark	ft	0.00
		Est. Water	Depth		in	1.0	m	0.0		High Water I		m	0.00
		Surface Ve	•		ft/s	0.1	m/s	0.0		% of Stream		ology	
			-						Rif	fle %	Rui	n %	
		Channelize	ed 🔲 yes	<b>✓</b> No	)					ol %		de Pool	
		Dam Prese	entYes	<b>✓</b> No	)				Ste	ep Pool Series			
LARGE WOOD	Υ	LWD 0.	.0 m²		0	ft²							
DEBRIS				2	2						-		
		Density of	LWD	m²/k	m'	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	0.	000000	0000

AQUATION	С		Indicate the dom	ninant type and re	cord th	e don	ninant species pre	esent	
VEGETA	TION		Rooted Emergent	Rooted Subm	ergent		Rooted Floating	✓ None	<u> </u>
			☐ Free Floating	Attached Alga	ae		Floating Algae		
			Portion of the re	ach with aquatic	venetat	ion nr	recent		0 %
			r ortion or the re-	acii wilii aqualic y	regetat	ion pi	esent		U /0
WATER	QUALITY		Temperature	### °C <u>n/a</u>	57.3	Wat	er Odors		
			Conductivity	μs/cm	164.9	✓N	ormal/None Sev	wage	Petroleum
			Total Dissolved	Solids 117	mg/l	С	hemical	aerobic	
			pH <b>7.5</b>						
			Turbidity			Wat	er Surface Oils		
				ght Turbid Tur	bid	П	Slick Sheen	Globs	Flecks
				ained Oth		_	Other		
0501145	\ ! <b>-</b> /			<u> </u>			<b>.</b>		
SEDIME			Odors				<b>Deposits</b>		]pgh
SUBSTR	AIE			_	etroleum		Sludge Saw	oust Other	Paper fiber Sand
				Anaerobic N	one		Relic Shells	Other	
			Other				Looking at atono	o whio	h ara nat daanly
			Oils				Looking at stone		ides black in color?
			✓ Absent ☐ SI	ight Moderate	Пв	rofuse	Yes		No
IN.	IOPGANIC	SIIB	STRATE COMPO	<u> </u>	<u> </u>		SANIC SUBSTRA		
Substrate				e inSampling	Subst		Characteris		% Composition in
Туре	Diame		-	ach	Туј		Onaraotorio		Sampling Reach
Bedrock					Detr		Sticks, wood, co	oarse	oumpining mount
Boulder	>10"						plant materi		
Cobble	2.5 - 1	0"			Mu	ck-	Black very fir	ne	
Gravel	0.1 - 2.	5"	1	5	Мι	ıd	organic matt	er	
Sand	gritty		2	20	Ma	arl	Grey, shell		
Silt	gooey	/	6	50			fragments		
Clay	slick			5					
Hal	bitat		H/	ABITAT ASSESS	MENT	- LO\	N GRADINET ST	REAN	IS
Para	meter		Optimal	SubOptima	al		Marginal		Poor
1. Epifau	nal	_							•
Substrat		Greate	er than 50%	30-50% for low		10-30%	% for low	10% for	
1			er than 50% gradient streams)	30-50% for low gradient streams) mix	x of		% for low nt streams) mix of		dient streams)
Available	:e/	for low				gradie		low grad	
	:e/	for low of subs	gradient streams)	gradient streams) mix	uited	gradiei stable	nt streams) mix of	low grad	dient streams)
Available	:e/	for low of subs epifaur	gradient streams) strate favorable for	gradient streams) miz stable habitat; well-su	uited	gradiei stable availab	nt streams) mix of habitat; habitat	low grad stable h habitat i	dient streams) abitat; lack of
Available	:e/	for low of subs epifaur fish co	gradient streams) strate favorable for nal colonization &	gradient streams) mix stable habitat; well-su for full colonization	uited abitat	gradiei stable availat desirat	nt streams) mix of habitat; habitat bility less than	low grad stable h habitat i	dient streams) abitat; lack of is obvious;
Available	:e/	for low of subs epifaur fish co subme	gradient streams) strate favorable for nal colonization & ver; mix of snags,	gradient streams) mix stable habitat; well-su for full colonization potential; adequate h	uited abitat	gradiei stable availat desirat	nt streams) mix of habitat; habitat bility less than ble; substrate ntly disturbed or	low grad stable h habitat i substrat	dient streams) abitat; lack of is obvious;
Available	:e/	for low of subs epifaur fish co subme banks,	gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut	gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of	uited abitat e of	gradiei stable availab desirab frequei	nt streams) mix of habitat; habitat bility less than ble; substrate ntly disturbed or	low grad stable h habitat i substrat	dient streams) abitat; lack of is obvious;
Available	:e/	for low of subs epifaur fish co subme banks, stable	gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other	gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence	uited abitat e of	gradiei stable availab desirab frequei	nt streams) mix of habitat; habitat bility less than ble; substrate ntly disturbed or	low grad stable h habitat i substrat	dient streams) abitat; lack of is obvious;
Available	:e/	for low of subs epifaur fish co subme banks, stable to allow potenti	gradient streams) strate favorable for nal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage w full colonization ial (i.e., logs/snags	gradient streams) mix stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate in form of newfall, but new yet prepared for	abitat e of n ot	gradiei stable availab desirab frequei	nt streams) mix of habitat; habitat bility less than ble; substrate ntly disturbed or	low grad stable h habitat i substrat	dient streams) abitat; lack of is obvious;
Available	:e/	for low of subs epifaur fish co subme banks, stable to allow potenti	gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage w full colonization	gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence additional substrate in form of newfall, but n	abitat e of n ot	gradiei stable availab desirab frequei	nt streams) mix of habitat; habitat bility less than ble; substrate ntly disturbed or	low grad stable h habitat i substrat	dient streams) abitat; lack of is obvious;
Available	:e/	for low of subsepifaur fish consubme banks, stable to allow potentithat are	gradient streams) strate favorable for nal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage w full colonization ial (i.e., logs/snags	gradient streams) mix stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate in form of newfall, but new yet prepared for	abitat e of n ot	gradiei stable availab desirab frequei	nt streams) mix of habitat; habitat bility less than ble; substrate ntly disturbed or	low grad stable h habitat i substrat	dient streams) abitat; lack of is obvious;

2. Pool	Mixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no					
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.					
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged	-					
	mats and submerged	and submerged	vegetation.						
	vegetation common.	vegetation present.							
Score 6				<u>'</u>					
	20 19 18 17 16	15 14 13 12 11		6 5 4 3 2 1 0					
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small					
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.					
	small-deep pools present.	few shallow	pools.						
Score 2				<u>'</u>					
	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0					
	20 13 10 17 10	13 11 13 12 11	10 5 6 7						
4.Sediment	Little or no enlargement	Some new increase in	Moderate deposition of	Heavy deposits of fine					
Deposition	of islands or point bars	bar formation, mostly	new gravel, sand or fine	material, increased bar					
	and less than <20% of	from gravel, sand or fine	sediment on old and new	development; more than					
	the bottom affected by	sediment; 20-50% of the	bars; 50-80% of the	80% of the bottom					
	sediment deposition.	bottom affected; slight	bottom affected; sediment	changing frequently; pools					
		deposition in pools.	deposits at obstructions,	almost absent due to					
			constrictions, and bends;	substantial sediment					
			moderate deposition of	deposition.					
			pools prevalent.						
Score 16									
I I	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0					
5. Channel Flow	Water reaches base of	Water fills >75% of the	Water fills 25-75% of the	Very little water in					
Status	both lower banks, and	available channel; or	available channel, and/or	channel and mostly					
	mimimal amount of	<25% of channel	riffle substrates are	present as standing pools.					
	channel substrate is	substrate is exposed.	mostly exposed.	present as standing pools.					
	exposed.	Substrate is exposed.	mostry exposed.						
Score 4									
00010   4	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0					
		10 11 10 12 11							
6. Channel	Channelization or	Some channelization	Channelization may be	Banks shored with gabion					
Alteration	dredging absent or	present, usually in areas	extensive; embankments	or cement; over 80% of					
	minimal; stream	of bridge abutments;	or shoring structures	the stream reach					
	with normal	evidence of past	present on both banks;	channelized and disrupted.					
	pattern.	channelization, i.e.,	and 40 to 80% of stream	Instream habitat greatly					
		dredging, (greater than	reach channelized and	altered or removed					
		past 20 yr) may be	disrupted.	entirely.					
		present, but recent							
		channelization is not							
		present.							
Score 17			<u>-                                    </u>						
<u> </u>	20 19 18 17 16	15 14 13 12 11	11 10 9 8 7 6 5 4 3 2 3						
			,	6 5 4 3 2 1 0					

7 Ohannal					I			I			la			
7. Channel		The bends in t		n	The bends i			The bends			Channel stra	0 /		
Sinuosity		increase the s	tream		increase the	e stream		increase the			waterway ha			
		length 3 to 4 ti	mes long	er	length 2 to 3	3 times l	onger	length 1 to	2 times	longer	channelized	for a long	g	
		than if it was i	n a straigh	nt	than if it was	s in a str	aight	than if it wa	s in a st	raight	distance.			
		line. (Note - ch	nannel		line.			line.						
		braiding is cor	nsidered											
		coastal plains	and other	•										
		normal low-lyi	ng areas.											
		this parameter	r is not											
		easily rated in	these											
		areas.)												
Score 6	3		1 [	П		ПГ	1 [		П			пп		
		20 19 1	.8 17	<u>1</u> 6	15 14	13	12 11	. 10	9 8	<u> </u>	6 5 4	3	2 1	
		20 13 1			15 1.			T						
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstabl	e; 30-	Unstable; many eroded areas;			
(score each ban	ık)	of erosion or b	ank failur	е	infrequent,	small are	eas of	60% of ban	k in rea	ch has	"raw" areas	frequently	y along	
Note: determine left	or	absent or mini	mal; little		erosion mos	stly heale	ed	areas of ero	osion; hi	igh	straight sect	ions and	bends;	
right side by facing		potential for fu	iture		over. 5-30%	c in	erosion pot	ential du	uring	obvious ban	k sloughi	ng;		
downstream.		problems. <5%	6 of bank		reach has a	reas of		floods.			60-100% of	bank has		
		affected.			erosion.						erosional scars.			
Score (LB)	3		П	П		П	П		П	<b>V</b>				
(==)		Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	3			$\dot{\overline{\Box}}$	$\overline{}$	$\vec{\Box}$	$\overline{}$	$\overline{\Box}$	$\overline{\Box}$	<u> </u>	$\overline{}$	$\overline{\Box}$		
Coole (ICE)		Right Bank	10	9	<u> </u>	<u> </u>	<u> </u>		4	3		1		
		MgHt Bank	10					T			<u> </u>			
9. Vegetative		More than 90%	% of the		70-90% of t	he strea	m-	50-70% of t	he strea	am-	Less than 5	0% of the		
Protection (sc	ore	streambank sı	urfaces ar	nd	-bank surfac	ces cove	ered	bank surfac	es cove	ered	streambank	surfaces		
each bank)		immediate ripa	arian zone	es	by native ve	egetation	, but	by vegetation	on; disru	uption	covered by	vegetatio	n;	
Note: determine left	or	covered by na	tive		one class of	f plants i	s not	obvious; pa	tches o	f bare	covered by vegetation; disruption of streambank			
right side by facing		vegetation, inc			not well rep	•		soil or close			vegetation is very high;			
downstream.		trees, underst	•	s	disruption e			vegetation			vegetation has been			
downouroum.		or nonwoody	ory ornab	Ο,	affecting ful			than one-ha			removed to	.do 20011		
		macrophytes;	voqotativ	^	potential to			potential pla			5 centimete	re or loce	in	
			Ū	5	ľ					DIE				
		disruption thro			extent; more			height rema	aming.		average stu	oble neig	nt.	
		grazing or mo	•		half of the p									
		minimal or not	-		stubble heig	ght rema	ining.							
		almost all plar		d										
		to grow natura	ally.											
Score (LB)	7					V			Ц					
		Left Bank	10	9	8		6	5	<u>4</u>	3	2	1_		
Score (RB)	7		Ш	<u> </u>	U	<u> </u>	Ц		<u>Ц</u>	Ц_	Ц	Щ_	Ш	
		Right Bank	10	9	8	7	6	5	4	3	2	1		
10. Riparian		Width of ripari	an zone		Width of ripa	arian zoi	ne 12-	Width of rip	arian zo	ne 6-	Width of ripa	arian zone	2 < 6	
Vegstative Zo	ne	>18 meters; h			18 meters; I			12 meters;			meters: little			
_		·			•			·		_				
Width (score ea	acn	activities (i.e.,	parking		activities ha	ive impa	cted	activities ha	ive impa	acted	vegetation of	lue to hur	nan	
bank riparian		lots, roadbeds	, clear-		zone only m	ninimally		zone a grea	at deal.		activities.			
zone)		cuts, lawns, o	r crops)											
		have not impa	cted zone	<del>)</del> .										
Score (LB)	8		П	П	<b>V</b>	П	П	$\Box$	П			П		
(,		Left Bank	10	9	8	<u> </u>	6	_ <u></u>	4	<u></u>	2	1		
Score (RB)	1			Ť	$\overline{\Box}$	一	$\overline{\Box}$	$\overline{\Box}$	$\overline{\Box}$	$\overline{\Box}$		$\overline{\mathbf{Z}}$	$\neg$	
/	•	Right Bank	10	9	<u> </u>	7	<u> </u>		4	3		1		
TOTAL SCORE	86	_				-			•					
. JIAL GOOKL	50													

Project ID:	Somerville	South An	nendm	ent 2	Stream Class:				Ephemeral				
Stream ID:	#20				Lo	catio	n:		Mack	cey, IN			
Lat:	38.23766	Long:		-87.3518	2 Ri	ver B	asin:		Ohio				
Investigators:	Will Wrigh	t											
Ciamatura.				Date:		5-May	y-2011		Reas	on for Surve	y:		
Signature:				Time:			2:1	17 PM	404 F	unctional As	sessm	ent	
	•							•					
WEATHER		Current			Past 2	24-Hc	ours			Heavy rain in	n last 7	-days	
CONDITIONS		Storm (H	eavy Rain	)	Sto	rm (He	avy Rair	n)		□ NO [s	<b>✓</b> Yes		
		Rain Stea	dy		Rai	n Stead	dy			Air Temp °C		18	
		Showers	(Intermitt	ent)	Sho	wers (	Intermit	tent)		Air Temp °F		65	
		Cloud Cov	ver %		☑ Clo	ud Cove	er %		90	Other:			
		✓ Clear/Sur	nny		Clea	ar/Sunr	าy						
SITE LOCATION	ON/MAD	See Atta	chmon	•									
SHE LOCATION	JIN/IVIAP	See Alla	Cililen	<u>.                                    </u>									
STREAM		Stream Su	ubsyste	em					Strea	ат Туре			
CHARACTERI	ZATION	Perennial		ntermittent	✓ E <sub>l</sub>	phemer	ral		Со	ldwater			
									✓ W	armwater			
		Stream O	rgin							Catchn	nent Ar	ea	
		Upland R	unoff	[	<b>Mixture</b>	of Orig	gins			Mile <sup>2</sup>		0.01	
		Spring-fe	d/Ground	water	Wetland	d 🔲	Other			Km <sup>2</sup>		0.0	
WATERSHED		Surround	ina Lar	nd uso 8	Dorcor	ntago		Loca	l Wat	ershed NPS F	Pollunt	ion	
FEATURES			_			_							
FEATURES		Forest		### <u> </u>		31		∐No		_			nŧ
		Field/Past		Ц	Other			☑ Ob		ershed Erosi		sedimer	IIL
		Residentia					_			_	_		
		Residenti	aı					Nor	ne <u>L</u> ⊻	Moderate	Heavy		
RIPARIAN		Indicate tl	he dom	inant ty	pe and	redor	rd the	domir	nant s	species prese	ent		
VEGETATION		✓ Trees	Shrubs	Gras	ses	Herbs		None					
(18 meter buff	fer)	Dominant	Specie	es: Sof	t mast f	forest	t						
INSTREAM		Est. Reach	n Lenat	h	ft	79	m	24		Canopy Cov	or		
FEATURES		Est. Stream			ft	7.5	m	0.0			Partly	ν Open	
ILATOREO		Sampling I			ft <sup>2</sup>	0	m <sup>2</sup>	0.0		✓ Shaded		y ShadedC	
		Sampling A			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		Shaded	гагиу	y Shaueuc	
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water Ma	ark f	t 0.0	00
		Est. Water			in	0.0	m	0.0		High Water Ma		n 0.0	
		Surface Ve	•		ft/s	0.0	m/s	0.0		% of Stream M			00
		Surface Ve	Cicoity		143	0.0	111/3	0.0	Dif	_	Run %		
		Channelize	ed ∏₁	′es ☑।	do.				_	_	Glide P		
		Dam Pres	_							ep Pool Series	Gilde P	UUI	
						- 2				P 1 001 001103			
LARGE WOOD DEBRIS	Y	LWD 0	).0 r	m²		ft <sup>2</sup>				_			
		Density o	f LWD	$m^2$	km²	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	0.000	000000	0

VEGETATION	✓ Rooted Emergent				ninant species pr ]Rooted Floating	None	2
•======================================	Free Floating	Attached Alg	•		Floating Algae	LI NOIN	
		ach with aquatic					15 %
WATER QUALITY	Temperature	#### °C n/a	°F	Wat	er Odors		
	Conductivity	μs/cm		l —	ormal/None Se	wage	Petroleum
	Total Dissolved	Solids	mg/l	□с	hemical An	aerobic	
No Water Present	pH						
	Turbidity			Wat	er Surface Oils		
	☐ Clear ☐ Sli	ght Turbid	bid		Slick Sheen	Globs	Flecks
	Opague St	ained Oth	ner		Other		
SEDIMENT/	Odors				Deposits		
SUBSTRATE	✓ Normal	☐ Sewage ☐ P	etroleum		Sludge Saw	dust _	Paper fiber Sand
	Chemical	Anaerobic N	lone		Relic Shells	Other	
	Other						
					Looking at stone		
	Oils  ✓ Absent SI				<u>~</u>		des black in color?
INODCANIC CUI	Absent SI	<u> </u>	: LP	rofuse	Yes		No
Substrate Diameter	T	e inSampling	Subst		Characteris		% Composition in
Type	-	ach	Typ		Characteris	iic	Sampling Reach
Bedrock			Detr		Sticks, wood, c	oarse	Camping Reach
Boulder >10"					plant materi		
Cobble 2.5 - 10"			Mud	ck-	Black very fir	ne	
Gravel 0.1 - 2.5"			Mι		organic matt		
Sand gritty		5	Ma	arl	Grey, shel		
Silt gooey		30			fragments		
Clay slick		15					
Habitat		ABITAT ASSESS		- LOV		REAN	
Parameter	Optimal	SubOptima	al		Marginal		Poor
"	ater than 50%	30-50% for low	v of		% for low	10% for	
	ow gradient streams)  ubstrate favorable for	gradient streams) mis stable habitat; well-si		_	nt streams) mix of habitat		dient streams) abitat; lack of
_	aunal colonization &	for full colonization			pility less than		is obvious;
'	cover; mix of snags,	potential; adequate h			ole; substrate		te unstable or
	nerged logs, undercut	for maintenance of			ntly disturbed or	lacking.	
Subi			e of	remove	ed.		
	s, cobble or other	populations; presenc	,0 0.				
bank	ss, cobble or other le habitat & at stage	populations; presence additional substrate i					
bank stabl	•		in				
bank stabl to all pote	le habitat & at stage low full colonization ntial (i.e., logs/snags	additional substrate i form of newfall, but n yet prepared for	not				
bank stabl to all pote that	le habitat & at stage low full colonization ntial (i.e., logs/snags are not new fall and	additional substrate if form of newfall, but no yet prepared for colonization (may rate)	not				
bank stabl to all pote that	le habitat & at stage low full colonization ntial (i.e., logs/snags	additional substrate i form of newfall, but n yet prepared for	not				
bank stabl to all pote that	le habitat & at stage low full colonization ntial (i.e., logs/snags are not new fall and	additional substrate if form of newfall, but no yet prepared for colonization (may rathly high end of scale).	not	10		□ [ 6 5	□ □ ☑ □ 4 3 2 1 0

2. Pool	Mixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no				
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.				
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged					
	mats and submerged	and submerged	vegetation.					
	vegetation common.	vegetation present.						
Score 6								
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small				
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.				
	small-deep pools present.	few shallow	pools.					
Score 2								
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
4.Sediment	Little or no enlargement S	Some new increase in	Moderate deposition of	Heavy deposits of fine				
Deposition			new gravel, sand or fine	material, increased bar				
Deposition	·	from gravel, sand or fine	sediment on old and new	development; more than				
			bars; 50-80% of the	80% of the bottom				
	ĺ	oottom affected; slight	bottom affected; sediment	changing frequently; pools				
	'	deposition in pools.	deposits at obstructions,	almost absent due to				
		deposition in pools.	•	substantial sediment				
			constrictions, and bends;					
			moderate deposition of	deposition.				
Score 17			pools prevalent.					
Score 17	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
5. Channel Flow	Water reaches base of	Water fills >75% of the	Water fills 25-75% of the	Very little water in				
Status		available channel; or	available channel, and/or	channel and mostly				
Status		<25% of channel	riffle substrates are	present as standing pools.				
			mostly exposed.	present as standing pools.				
		substrate is exposed.	mostly exposed.					
Score 1	exposed.							
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
6. Channel	Channelization or	Some channelization	Channelization may be	Banks shored with gabion				
Alteration			extensive; embankments	or cement; over 80% of				
	'	of bridge abutments;	or shoring structures	the stream reach				
	·	evidence of past	present on both banks;	channelized and disrupted.				
		•	and 40 to 80% of stream	Instream habitat greatly				
		dredging, (greater than	reach channelized and	altered or removed				
			disrupted.	entirely.				
	l l'	present, but recent	-1					
	l l'	channelization is not						
		present.						
Score 18				<del>'</del>				
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
			• ,					

												-	
7. Channel		The bends in t	he stream	The bend	ds in the sti	ream	The bends	in the strea	am	Channel stra	iight;		
Sinuosity		increase the st	ream	increase	the stream	1	increase th	e stream		waterway ha	s been		
		length 3 to 4 til	mes longei	length 2	to 3 times I	onger	length 1 to	2 times lon	ger	channelized	for a long	g	
		than if it was in	a straight	than if it	was in a sti	raight	than if it wa	s in a strai	ght	distance.			
		line. (Note - ch	annel	line.			line.						
		braiding is con	sidered										
		coastal plains											
		normal low-lyir											
		this parameter	•										
		easily rated in											
		areas.)											
Score 6	<u> </u>	П Г		<del>-                                    </del>			<del>' п п</del>		1 🔽				
00010		20 19 1	<u></u> 8 17	<u> </u>	<u> </u>	<u> </u>	<u></u> L 10	9 8	<u>. ⊻.</u> 7	6 5 4	<u> </u>	2 1	
		20 19 1	0 17	10 13	14 13	12 11	10	9 0					
8. Bank Stabil	ity	Banks stable;	evidence	Moderate	ely stable;		Moderately	unstable;	30-	Unstable; many eroded areas;			
(score each bar	ık)	of erosion or b	ank failure	infrequer	nt, small are	eas of	60% of ban	k in reach	has	"raw" areas f	frequently	y along	
Note: determine left	t or	absent or mini	mal; little	-	nostly heal		areas of er	osion; high		straight secti	ions and	bends;	
right side by facing		potential for fu		over. 5-3	0% of bank	k in	erosion pot	_		obvious banl			
downstream.	m. problems. <5% of bank				s areas of		floods.		5	60-100% of I	J	0,	
		affected.		erosion.						erosional sca			
Score (LB)	8					$\neg$	$\Box$	$\overline{}$	$\overline{\Box}$	-		$\neg$	
000.0 (22)	_	Left Bank	10	9 8	7	6	<del></del>	4	3	2	1		
Score (RB)	8	LCTC Barrix		<u>,                                    </u>	<del></del>	$\overline{\Box}$		$\overline{\Box}$	$\overline{\Box}$		一	$\neg$	
Score (IVD)	0	Dight Donk	<u> </u>		<u></u>	<u> </u>	<u></u>	4	3	<u></u>	<u> </u>		
		Right Bank 1	10 3	7 0		0	J	4	3				
9. Vegetative		More than 90%	6 of the	70-90%	of the strea	ım-	50-70% of	the stream	-	Less than 50	% of the		
Protection (sc	ore	streambank su	ırfaces and	-bank su	rfaces cove	ered	bank surfac	es covere	d	streambank	surfaces		
each bank)		immediate ripa	rian zones	by native	vegetation	n, but	by vegetation	on; disrupti	on	covered by v	egetation	n;	
Note: determine left	t or	covered by nat	tive	one class	s of plants i	is not	obvious; pa	tches of ba	are	disruption of streambank			
right side by facing		vegetation, inc			represented		soil or close			vegetation is very high;			
downstream.		trees, understo	•		n evident b		vegetation			vegetation h		,	
downstream.		or nonwoody	ny omaso,		full plant g		than one-ha	•	500	removed to	do been		
		macrophytes;	voqotativo		to any grea		potential pla			5 centimeter	c or locc	in	
			-	ľ									
		disruption thro			nore than o		height rema	alling.		average stub	bble fleigi	II.	
		grazing or mov	•		e potential	•							
		minimal or not		stubble r	neight rema	ıınıng.							
		almost all plan											
- " - \		to grow natura	lly.				<u> </u>						
Score (LB)	8		<u> </u>		Ц		<u> </u>	Ц	Ц_				
<b>.</b> (5.5)		Left Bank	10	9 8	7	6	5	4	3	2	1		
Score (RB)	8					<u> </u>	<u> </u>	<u> </u>	<u> Ц</u>	<u> </u>	<u> </u>	Ш	
		Right Bank 1	10 9	8	7	6	5	4	3	2	1		
10. Riparian		Width of riparia	an zone	Width of	riparian zo	ne 12-	Width of rip	arian zone	6-	Width of ripa	rian zone	e <6	
Vegstative Zo	nΔ	>18 meters; hu			s; human		12 meters;			meters: little			
•		•					,				•		
Width (score e	acn	activities (i.e.,	_		have impa		activities ha		ed	vegetation d	ue to hur	nan	
bank riparian		lots, roadbeds,	clear-	zone onl	y minimally	<b>'.</b>	zone a grea	at deal.		activities.			
zone)		cuts, lawns, or	crops)										
		have not impa	cted zone.										
Score (LB)	6					<b>✓</b>							
		Left Bank	10	9 8	7	6	5	4	3	2	1		
Score (RB)	8												
		Right Bank 3	10 9	8	7	6	5	4	3	2	1		
TOTAL SCORE	97												

Project ID:	Somerville	South A	mend	ment :	2	Stream Class:				Ephemeral					
Stream ID:	#21					Lo	catio	n:		Mackey, IN					
Lat:	38.23785	Long:		-87.3	35165	Riv	ver B	asin:		Ohio					
Investigators:	Nate Nola	nd													
Cianatura				Dat	:e:	,	5-May	/-2011	1	Reas	on for Surv	/ey:			
Signature:				Tim	ie:			2:2	21 PM	404 F	unctional A	Asses	sment		
WEATHER		Current				Past 2	24-Ho	urs			Heavy rain	in las	t 7-day	'S	
CONDITIONS		Storm (	Heavy R	ain)		Sto	rm (Hea	avy Rair	n)		□NO	✓ Yes	;		
		Rain Ste	eady			Rair	n Stead	ly			Air Temp °	С	•	18	
		Showers	s (Interr	mittent)		Sho	wers (I	Intermit	tent)		Air Temp °	F	(	<b>3</b> 5	
		Cloud C	over %			<b>☑</b> Clou	ud Cove	er %		90	Other:				
		✓ Clear/Su	unny			Clea	ar/Sunr	ny							
OITE LOCATIO		0 44		4											
SITE LOCATION	JN/WAP	See Att	acnm	ent											
STREAM		Stream S	Subsy	stem						Strea	am Type				
CHARACTERI	ZATION	Perenni	al [	Interm	ittent	<b></b> ✓E¦	ohemer	al		Со	ldwater				
										<b>✓</b> w	armwater				
		Stream 0	Orgin								Catch	nment	Area		
		Upland	Runoff		abla	Mixture	of Orig	jins			Mile <sup>2</sup>		0.	.01	
		☐ Spring-f	ed/Grou	ınd wate		Wetland		Other			Km <sup>2</sup>		0	0.0	
WATEROUER		0			0 -		4			cal Watershed NPS Polluntion					
WATERSHED		Surroun	aing L				_		_						
FEATURES		Forest		####		mmercia	al		∐No				ntial sour		
		Field/Pa			Otl	her			✓ Ob\		_		ed sedi	ment	
		Agricult						_			ershed Eros				
		Residen	tial						Nor	ne <u>L</u> ✓	Moderate	Heav	'y		
RIPARIAN		Indicate	the do	ominai	nt typ	e and	redor	d the	domir	ant s	species pre	sent			
VEGETATION		✓ Trees	Shru	ıbs 🗀	Grasse	es 🗌	Herbs		None						
(18 meter buff	fer)	Dominar	nt Spe	cies:	Mixe	d hard	and	soft n	nast fo	rest					
INICEDEAM		Fat Dag		41-		£ı.	40		40		00-				
INSTREAM		Est. Read				ft	40				Canopy Co				
FEATURES		Est. Strea				ft ft <sup>2</sup>	0	m m²	0.0		Open		artly Ope		
		Sampling Sampling				mile <sup>2</sup>	0 0.0	km <sup>2</sup>	0		✓ Shaded	P.	artly Shad	dedC	
		Area in k		IIIIIE		mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		1 I:I- \A/-4 A	\ <b>4</b> =  .	44	0.00	
				41.			0.0		0.0		High Water N		ft	0.00	
		Est. Wate				in "/-	/	m	0.0		High Water N		m	0.00	
		Surface \	eiocit	У		ft/s	n/a	m/s	####		% of Stream		0,		
		Charrel"		_						_	fle %	Rur			
		Channeli		Yes	☑ No					_	ol %	∐ Glid	de Pool		
		Dam Pre	sent	Yes	✓ No	)				St∈	ep Pool Series				
LARGE WOOD DEBRIS	Y	LWD	0.0	_m²		0	ft <sup>2</sup>								
		Density	of LW	D	m²/k	m²	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	0.	000000	0000	

AQUATIO			Indicate the dom	ninant type and re	cord th	e don	minant species pr	esent	
VEGETA	TION		✓ Rooted Emergen		•		Rooted Floating	☐ None	e
			☐ Free Floating	Attached Alg	ae		Floating Algae		
			Portion of the re	ach with aquatic	vegetat	ion pr	resent		35 %
NA/ATED /	OLIAL ITY								<u> </u>
WATER	QUALITY		Temperature	#### °C n/a	°F		ter Odors		П
			Conductivity Total Dissolved	μs/cm	ma/l	_	lormal/None Sev	_	Petroleum
No W	Vater Pres	ont	pH pissolved	Solius	mg/l	Пс	Chemical An	aerobic	
l lao v	valei Fies	GIIL	PI						
			Turbidity			Wat	ter Surface Oils		
				ight Turbid 🔲 Tur	bid			Globs	Flecks
			Opague St	ained Oth	er		Other		
SEDIME	NT/		Odors				Deposits		
SUBSTR	ATE		✓ Normal	Sewage P	etroleum		Sludge Saw	dust [	Paper fiber Sand
			Chemical	Anaerobic N	lone		Relic Shells	Other	
			Other						
							Looking at stone		
			Oils	_	_		<u> </u>		ides black in color?
				light Moderate	P	rofuse	Yes		No
			STRATE COMPO				SANIC SUBSTRA		T
Substrate	Diame	ter	-	e inSampling	Subst		Characteris	tic	% Composition in
Type			ı Ke	ach	Тур	Ω			Sampling Reach
			- 110	-4011			Otialiaaad a		Sampling Reach
Bedrock	- 10"				Detr		Sticks, wood, co		Sumpling Reden
Bedrock Boulder	>10"				Detr	itus	plant materi	al	Jumping reading
Bedrock Boulder Cobble	2.5 - 1	0"			Detr Mud	itus ck-	plant materi Black very fi	al ne	Jumpining recuent
Bedrock Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" .5"			Detr Mud Mu	itus ck- ud	plant materi Black very fii organic matt	al ne er	Jumpining recuent
Bedrock Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2. gritty	0" 5"		95	Detr Mud	itus ck- ud	plant materi Black very fii organic matt Grey, shell	al ne er	Jumpining recuent
Bedrock Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" .5" y	9		Detr Mud Mu	itus ck- ud	plant materi Black very fii organic matt	al ne er	Jumpining recuen
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick	0" .5" y	<u> </u>	95 5	Detr Mud Mu Ma	itus ck- ud arl	plant materi Black very fir organic matt Grey, shell fragments	al ne er	
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick	0" .5" y	(S)	95 5 ABITAT ASSESS	Mud Mu Ma Ma	itus ck- ud arl	plant materi Black very fii organic matt Grey, shell fragments	al ne er	18
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Para	2.5 - 1 0.1 - 2 gritty gooe slick oitat meter	0" 5" y	<u> </u>	95 5	Mud Mud Ma Ma	itus ck- ud arl	plant materi Black very fir organic matt Grey, shell fragments	al ne er	IS Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick  pitat meter nal	0" 5" y	HA Optimal	95 5 ABITAT ASSESS SubOptima	Mud Mu Ma Ma	itus  ck-  id  arl  - LO\	plant materi Black very fir organic matt Grey, shell fragments W GRADINET ST	al ne er REAN	IS Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	0" 5" y  Greate for low	HA Optimal er than 50%	95 5 ABITAT ASSESS SubOptima 30-50% for low	Mu Ma Ma MENT	ck- ud arl - LO\ 10-309 gradiel	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal	REAN	1S Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Parai  1. Epifaui Substrat	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs	HA Optimal er than 50% gradient streams)	95 5 ABITAT ASSESS SubOptime 30-50% for low gradient streams) mi	Muc Mu Ma	ck- ud arl  10-30% gradier stable	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal % for low nt streams) mix of	REAN 10% for low grastable h	Poor r dient streams)
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subsepifaur	HA Optimal er than 50% gradient streams) strate favorable for	SubOptime 30-50% for low gradient streams) mi stable habitat; well-s	Mu Ma Ma Me	ck- ud arl  10-309 gradier stable availate	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low nt streams) mix of habitat; habitat	REAM 10% for low grastable habitat	Poor dient streams) habitat; lack of
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish co	HA Optimal or than 50% gradient streams) strate favorable for hal colonization &	30-50% for low gradient streams) mi stable habitat; well-s for full colonization	Muc Mu Ma Ma Ma Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-309 gradiel stable availab desiral	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal % for low nt streams) mix of habitat; habitat bility less than	REAM 10% for low grastable habitat	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish co subme	Optimal er than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags,	SubOptime 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h	Muc Mu Ma	ck- ud arl  10-309 gradiel stable availab desiral	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish co subme banks,	Optimal er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, erged logs, undercut	SubOptime 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of	Mu Ma Ma MeMENT al	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subs epifaui fish co subme banks, stable	Optimal  The than 50%  The gradient streams)  Strate favorable for than colonization & the colonization wer; mix of snags, arged logs, undercut cobble or other	30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of populations; presence	Muc Mu Ma	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greater for low of subsepifaur fish cosubme banks, stable to allow potenti	HA Optimal er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, gred logs, undercut cobble or other habitat & at stage w full colonization ial (i.e., logs/snags	30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of populations; presence additional substrate if form of newfall, but myet prepared for	Mu Ma Ma MeMENT al Member	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	O"  5"  Greate for low of subsepifaur fish co subme banks, stable to allow potentit that are	H/Optimal  That than 50%  The gradient streams)  The strate favorable for that colonization & the streams of snags, the gradient streams of snags, the gradient streams of snags, the gradient stream of snags, the grad	ABITAT ASSESS SubOptime 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of populations; presence additional substrate if form of newfall, but n yet prepared for colonization (may rate	Mu Ma Ma MeMENT al Member	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Parai 1. Epifaui Substrat Available Cover	2.5 - 1 0.1 - 2 gritty gooe slick  oitat meter nal e/	O"  5"  Greate for low of subsepifaur fish co subme banks, stable to allow potentit that are	HA Optimal er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, gred logs, undercut cobble or other habitat & at stage w full colonization ial (i.e., logs/snags	30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate h for maintenance of populations; presence additional substrate if form of newfall, but myet prepared for	Mu Ma Ma MeMENT al Member	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2 gritty gooe slick bitat meter nal	Greater for low of subsepifaur fish consubservable to allow potentiat are not train	H/Optimal  That than 50%  The gradient streams)  The strate favorable for that colonization & the streams of snags, the gradient streams of snags, the gradient streams of snags, the gradient stream of snags, the grad	ABITAT ASSESS SubOptime 30-50% for low gradient streams) mi stable habitat; well-s for full colonization potential; adequate r for maintenance of populations; presence additional substrate if form of newfall, but re yet prepared for colonization (may rate high end of scale).	Mu Ma Ma MeMENT al Member	ck- ud arl  10-30% gradiet stable availab desiral freque remove	plant materi Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal % for low nt streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or ed.	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or

	T , , , , , , , , , , , , , , , , , , ,
2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: no
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged
	mats and submerged vegetation.
	vegetation common. vegetation present.
Score 6	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small
	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.
	small-deep pools present. few shallow pools.
Score 1	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4.Sediment	Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine
Deposition	of islands or point bars bar formation, mostly new gravel, sand or fine material, increased bar
	and less than <20% of from gravel, sand or fine sediment on old and new development; more than
	the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom
	sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools
	deposition in pools. deposits at obstructions, almost absent due to
	constrictions, and bends; substantial sediment
	moderate deposition of deposition.
	pools prevalent.
Score 18	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
5. Channel Flow	Weter file 770/ of the Weter file 770/ of the Weter file 05 770/ of the Weter file 105 770/
	Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in
Status	both lower banks, and available channel; or available channel, and/or channel and mostly
	mimimal amount of <25% of channel riffle substrates are present as standing pools.
	channel substrate is substrate is exposed. mostly exposed.
	exposed.
Score 1	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6. Channel	Channelization or Some channelization Channelization may be Banks shored with gabion
Alteration	dredging absent or present, usually in areas extensive; embankments or cement; over 80% of
	minimal; stream of bridge abutments; or shoring structures the stream reach
	with normal evidence of past present on both banks; channelized and disrupted.
	pattern. channelization, i.e., and 40 to 80% of stream Instream habitat greatly
	dredging, (greater than reach channelized and altered or removed
	past 20 yr) may be disrupted. entirely.
	present, but recent
	channelization is not
Score 16	present.
Score 16	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

7. Channel		The bends in t	the stream	n	The bends i	in the str	eam	The bends	in the stre	eam	Channel stra	aight;			
Sinuosity		increase the s	tream		increase the	e stream		increase th	e stream		waterway ha	is been			
		length 3 to 4 ti	mes long	er	length 2 to 3	3 times lo	onger	length 1 to	2 times lo	nger	channelized	for a lon	g		
		than if it was in	n a straigh	nt	than if it was	s in a str	aight	than if it wa	s in a stra	aight	distance.				
		line. (Note - ch	nannel		line.			line.							
		braiding is cor	nsidered												
		coastal plains													
		normal low-lyi													
		this parameter	•												
		easily rated in													
		areas.)	11030												
Score 6	3	П Г		П						7 🔽					
ocoic C	,	20 19 1	<u>.                                    </u>	<u>1</u>	15 14	13	<u></u> 12 11	 L 10	<u>ы</u> 98	<u> </u>	6 5 4	<u> </u>	2 1		
		20 19 1	.6 17	10	13 14	13	12 13	1	9 0						
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable	30-	Unstable; many eroded areas;				
(score each ban	ık)	of erosion or b	ank failur	e	infrequent, s	small are	eas of	60% of ban	k in reach	n has	"raw" areas	frequentl	y along		
Note: determine left	or	absent or mini	mal; little		erosion mos			areas of er	osion; hig	h	straight sect	ions and	bends;		
right side by facing		potential for fu			over. 5-30%	of bank	in	erosion pot	_		obvious ban				
downstream.	m. problems. <5% of bank				reach has a			floods.		J	60-100% of	J	٠ <i>,</i>		
		affected.			erosion.	••					erosional sc				
Score (LB)	8			$\overline{\Box}$	<u> </u>		$\overline{\Box}$	<del>'</del>	$\overline{}$			<u> </u>	$\neg$		
000.0 (22)		Left Bank	10	9	8	7	6	<u></u>	4	3	2	1			
Score (RB)	8	Left Barik		Ť	<u> </u>	$\overline{}$	$\overline{}$		$\overline{}$	$\frac{1}{\Box}$		<del></del>			
Score (IVD)	0	Diah+ Dank	<u> </u>	9	<u>8</u>	<u> </u>	<u>Ц</u>	<u></u>	4	3	<u></u>	1			
		Right Bank	10	9	<u> </u>		- 0	<u> </u>	4						
9. Vegetative		More than 90%	% of the		70-90% of t	he streai	m-	50-70% of	the strean	∩-	Less than 50	0% of the			
Protection (sc	ore	streambank si	urfaces ar	nd	-bank surfac	ces cove	red	bank surface	ces covere	ed	streambank	surfaces			
each bank)		immediate ripa	arian zone	es	by native ve	egetation	, but	by vegetati	on; disrup	tion	covered by v	egetatio	n;		
Note: determine left	or	covered by na	tive		one class of	f plants is	s not	obvious; pa	tches of b	oare	disruption of streambank				
right side by facing		vegetation, inc			not well rep	•		soil or close			vegetation is very high;				
downstream.		trees, underst	•	\$	disruption e			vegetation			vegetation has been				
downon carri.		or nonwoody	ory ormabi	٥,	affecting ful			than one-ha		1000	removed to	45 50011			
		macrophytes;	voqotativ	^	potential to			potential pl		0	5 centimeter	e or loce	in		
			-	<del>.</del>	ľ					C					
		disruption thro	_		extent; more			height rema	alling.		average stul	ble rieig	rit.		
		grazing or mo	•		half of the p										
		minimal or not			stubble heig	gnt remai	ınıng.								
		almost all plar		d											
<u> </u>	_	to grow natura	ally.					<u> </u>							
Score (LB)	8			<u> </u>	<u> </u>	<u> </u>		<u> </u>	Ц	_Ц_	Ц				
<u> </u>		Left Bank	10	9	8		6	5	4	3	2	1_			
Score (RB)	8		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>			
		Right Bank	10	9	8	7	6	5	4	3	2	1			
10. Riparian		Width of ripari	an zone		Width of ripa	arian zor	ne 12-	Width of rip	arian zon	e 6-	Width of ripa	rian zone	e <6		
Vegstative Zor	nο	>18 meters; h			18 meters; I			12 meters:			meters: little				
_		•													
Width (score ea	acn	activities (i.e.,	-		activities ha			activities ha		ted	vegetation d	ue to hur	man		
bank riparian		lots, roadbeds	, clear-		zone only m	ninimally.		zone a grea	at deal.		activities.				
zone)		cuts, lawns, or	r crops)												
		have not impa	cted zone	<del>)</del>											
Score (LB)	8				abla										
		Left Bank	10	9	8	7	6	5	4	3	2	1			
Score (RB)	8				<b>V</b>										
		Right Bank	10	9	8	7	6	5	4	3	2	1			
TOTAL SCORE	97														

Project ID:	Somerville	South An	nendme	ent 2	Str	eam	Class	<b>s</b> :	Ephe	emeral			
Stream ID:	#22				Lo	catio	n:		Mack	cey, IN			
Lat:	38.23794	Long:	_	87.35129	Riv	er B	asin:		Ohio				
Investigators:	Will Wrigh	it											
O'mm at				Date:	5	5-May	/-2011	1	Reas	on for Surv	vey:		
Signature:				Time:			2:4	45 PM	404 F	unctional	Asses	sment	
			•										
WEATHER		Current			Past 2	24-Ho	urs			Heavy rain	in las	t 7-day	'S
CONDITIONS		Storm (He	eavy Rain)	)	Stor	m (Hea	avy Rair	n)		□NO	✓ Yes	5	
		Rain Stea	dy		Rain	Stead	y			Air Temp <sup>c</sup>	,C	1	18
		Showers	(Intermitte	ent)	Show	wers (I	- Intermit	tent)		Air Temp	'F	•	<b>3</b> 5
		Cloud Cov	ver %		✓ Clou				90	Other:			
		✓ Clear/Sun	nny		Clea	ır/Sunn	ıy						
							,						
SITE LOCATION	ON/MAP	See Atta	chment	t									
STREAM		Stream Su	ıbsyste	em					Strea	am Type			
CHARACTERI	ΙΖΔΤΙΟΝ	Perennial	-	ntermittent	√Fn	hemer	al		Coldwater				
				itorriiittorit	<b>—</b> - P	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	u.		✓ Warmwater				
		Stream O	rain						٧٧٠ ت		hment	∆rea	
		Upland R	_		✓ Mixture of Origins				Mile <sup>2</sup> 0.01				
		Spring-fee			✓ Mixture of Origins  ☐ Wetland ☐ Other					Km <sup>2</sup>		_	0.0
		Spring-red	u/ Ground	watei	Wettanu	<u> </u>	Other						
WATERSHED		Surround	ing Lan	ıd use & l	Percen	tage		Local	cal Watershed NPS Polluntion				
FEATURES		✓ Forest	1	<b>100%</b> 🔲 Co	mmercia	I		No	No evidence Some potential sources				
		Field/Past	ture	Otl	her			✓ Obv	Obvious sources Ag. induced sediment				ment
		Agricultur	e					Local	cal Watershed Erosion				
		Residentia	al					Nor	<u> </u>				
RIPARIAN		Indicate ti	ha dam	inant typ	o and r	odor	d tha	domir	ant c	species pre	cont		
VEGETATION		Trees				Herbs	_	None	iaiit	species pre	Sent		
(18 meter buff		Dominant	_	_	_		_	None					
(16 meter buil	er)	Dominant	Specie	35. SUIL	IIIa5t I	oresi							
INSTREAM		Est. Reach	n Length	า	ft	67	m	20		Canopy Co	over		
FEATURES		Est. Strear	m Width	1	ft		m	0.0		Open	☐ P	artly Ope	n
		Sampling I	Reach A	Area	ft <sup>2</sup>	0	$m^2$	0		✓ Shaded	☐ P	artly Shad	dedC
		Sampling /	Area mi	le <sup>2</sup>	mile <sup>2</sup>	0.0	$km^2$	0.0					
		Area in km	1 <sup>2</sup>		mile <sup>2</sup>	0.0	$km^2$	0.0		High Water	Mark	ft	0.00
		Est. Water	Depth		in		m	0.0		High Water	Mark	m	0.00
		Surface Ve	elocity		ft/s	n/a	m/s	####		% of Stream	Morph	ology	
			•						Rif	fle %	Rur	ı %	
		Channelize	ed □ <sub>Y</sub>	es 🔽 No	)					ol %		de Pool	
		Dam Prese	_	_						ep Pool Series			
LABOR WOOD	· · · · · · · · · · · · · · · · · · ·	1.14/2		2	, ,	it <sup>2</sup>			•				
LARGE WOOD	Υ	LWD 0	).0 n	n²	<u>0</u> f	τ							
DEBRIS			<del></del>	2	2	0.00		0000		e.2 2	_	00000	0000
		Density of	t LWD	m²/k	m <sup>-</sup>	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	O.	000000	0000

AQUATIO			Indicate	the don	ninant type	and re	cord th	ne don	ninant species	present	
VEGETA	TION		Roote	d Emergen	t Roote	ed Subm	nergent		Rooted Floating	✓ None	Э
			Free	loating	Attac	ched Alg	ae		Floating Algae		
			Portion	of the re	ach with ac	ruatic '	vedetat	tion pr	esent		0 %
			T OTGOTT	01 110 10		•					0 70
WATER	QUALITY		Tempe		#### °C	n/a	°F	Wat	er Odors		
			Conduc	•	µs/cm			□N	ormal/None	Sewage	Petroleum
			Total D	<u>isso</u> lved	Solids		mg/l	☐ C	hemical	Anaerobic	
No V	Vater Prese	ent	рН								
			Turbidi	V				Wat	er Surface Oils	3	
			Clear		ight Turbid	□Tur	bid		Slick Sheen	Globs	Flecks
			Opag		ained	Oth		_	Other		
SEDIME	NT/		Odors						Deposits		
SUBSTR			✓ Nor	mal	Sewage	Пь	etroleum		Sludge S	awdust [	Paper fiber Sand
JODSTIN	AIL		Che		Anaerobic	_				□ Other	Taper liber
			Oth		Allaelobic		ione		Kelic Silelis	Other	
				er					Looking at sto	nas whic	h are not deeply
			Oils						-		ides black in color?
			✓ Abse	nt SI	light $\square_N$	/loderate	. 🗆	Profuse			No
IN	ORGANIC	SUR				noderate					OMPONENTS
Substrate			1		e inSampli	ina	Subst		Characte		% Composition in
Туре	Diamo	.01	,,,,	•	ach	ອ	Ту		ona aoto		Sampling Reach
Bedrock							Detr		Sticks, wood	, coarse	oupgouo
Boulder	>10"						1		plant mat		
Cobble	2.5 - 10	0"					Mu	ck-	Black very		
Gravel	0.1 - 2.	5"					Mι	ıd	organic m		
Sand	gritty				5		Ma	arl	Grey, sh	nell	
Silt	gooey	/		S	90				fragmer	nts	
Clay	slick			;	5						
Hal	oitat			HA	ABITAT AS	SSESS	MENT	- LOV	W GRADINET	STREAM	1S
	meter		Optim			Optima			Marginal		Poor
1. Epifauı	nal	Greate	er than 50°		30-50% for lo			10-30%	% for low	10% for	
Substrat		for low	gradient :	streams)	gradient stre	ams) mi	x of		nt streams) mix of	low gra	dient streams)
Available			strate favo	•	stable habita	,		ľ	habitat; habitat	_	nabitat; lack of
Cover			nal coloniz		for full coloni				oility less than		is obvious;
		fish co	ver; mix o	f snags,	potential; ade	equate h	abitat	desirat	ole; substrate	substra	te unstable or
			erged logs	-	for maintena	•		freque	ntly disturbed or	lacking.	
			, cobble or		populations;	presenc	e of	remove	ed.		
		stable	habitat &	at stage	additional su	ıbstrate i	n				
		to allo	w full color	nization	form of newfa	all, but n	ot				
		potent	ial (i.e., lo	gs/snags	yet prepared	l for					
		that ar	e not new	fall and	colonization	(may rat	e at				
		not tra	ınsient).		high end of s						
Score	2										
		20	19 18	17 16	5 15 14	13	12 11	10	9 8 7	6 5	4 3 2 1 0

2. Pool	Mixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no				
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.				
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged					
	mats and submerged	and submerged	vegetation.					
	vegetation common.	vegetation present.						
Score 6								
	20 19 18 17 16	5 15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small				
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.				
	small-deep pools present.	few shallow	pools.					
Score 3								
	20 19 18 17 16	5 15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions,	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to				
			constrictions, and bends; moderate deposition of pools prevalent.	substantial sediment deposition.				
Score 18	20 19 18 17 16		10 9 8 7	6 5 4 3 2 1 0				
5. Channel Flow Status	Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.				
Score 1								
	20 19 18 17 16	5 15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0				
6. Channel	Channelization or	Some channelization		5 1 1 1 11 11				
Alteration	dredging absent or minimal; stream with normal pattern.	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted.  Instream habitat greatly altered or removed entirely.				
Alteration  Score 18	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed				

7. Channel		The bearing in	th tu	_	The beside:	414-		The beads	:		Charanal atm	- :l- 4.	
		The bends in t		n	The bends i			The bends			Channel stra	•	
Sinuosity		increase the s			increase the			increase th			waterway ha		
		length 3 to 4 to	-		length 2 to 3		•	length 1 to		Ū	channelized	for a long	g
		than if it was i	•	nt	than if it was	s in a str	aight	than if it wa	s in a str	aight	distance.		
		line. (Note - cl			line.			line.					
		braiding is cor	nsidered										
		coastal plains	and other	•									
		normal low-lyi	ng areas.										
		this paramete	r is not										
		easily rated in	these										
		areas.)											
Score 6	6												
		20 19 1	8 17	16	15 14	13	12 11	. 10	9 8	7	6 5 4	1 3	2 1
9 Pank Stabil	itv	Davides atalalas			Madaustalii	-4-bl-:		Madaustali		20	l la stable : se		
8. Bank Stabil	-	Banks stable;			Moderately			Moderately			Unstable; m	•	
(score each bar	•	of erosion or b		е	infrequent, s			60% of ban			"raw" areas		
Note: determine left	t or	absent or min	,		erosion mos	•		areas of er		•	straight sect		•
right side by facing		potential for fu			over. 5-30%		( In	erosion pot	entiai du	ring	obvious ban	J	<b>Ο</b> ,
downstream.		problems. <5%	⁄₀ of bank		reach has a	reas of		floods.			60-100% of		
0 (I D)		affected.	_		erosion.		_		_		erosional so	ars.	
Score (LB)	6			Ť		ᆜ	<u> </u>		Ц_	Щ.		Ц_	Ш
<b>(7.7)</b>		Left Bank	10	9	8	7	6	5	4	3	2	1_	
Score (RB)	6		Ш		Ш	Ш	<b>✓</b>		Ц	Ш		Ш	Ш
		Right Bank	10	9	8	7	6	5	4	3	2	1	
9. Vegetative		More than 90°	% of the		70-90% of t	he strea	m-	50-70% of	he strea	m-	Less than 5	0% of the	
Protection (sc	ore	streambank si		nd	-bank surface			bank surfac			streambank		
each bank)		immediate ripa			by native ve			by vegetation			covered by		
Note: determine left	tor	covered by na		,3	one class of	-		obvious; pa			•	•	
	l Oi	· ·				•					disruption of streambank vegetation is very high;		
right side by facing		vegetation, inc	•		not well rep			soil or close			_		n;
downstream.		trees, underst	ory stirub	5,	disruption e			vegetation		, iess	vegetation h	ias been	
		or nonwoody			affecting full			than one-ha		l.	removed to		:
		macrophytes;	•	В	potential to			potential pla		ле	5 centimete		
		disruption thro			extent; more			height rema	aining.		average stu	bble neig	nt.
		grazing or mo	•		half of the p								
		minimal or not	-		stubble heig	int rema	ining.						
		almost all plar		d									
Carra (LD)	_	to grow natura	ally.			_		<del></del>			<u> </u>		
Score (LB)	8			<u>Д</u>	$\overline{\square}$	Ц_	Ц_	<u> </u>	<u> </u>				Ш
O (DD)		Left Bank	10	9	8	7_	6	5	4	3	2	1_	
Score (RB)	8	D: 1 - D - 1	10	<u> </u>	<u> </u>	<u>Ц</u>	<u> </u>	<u> </u>	<u> </u>				Ш
		Right Bank	10	9	8	7	6	5	4	3	2	1	
10. Riparian		Width of ripari	an zone		Width of ripa	arian zoi	ne 12-	Width of rip	arian zo	ne 6-	Width of ripa	arian zone	e <6
Vegstative Zo	ne	>18 meters; h			18 meters; I			12 meters;			meters: little		
Width (score e		•					otod	•		otod		•	
-	acii	activities (i.e.,	-		activities ha	•		activities ha		cieu	vegetation o	iue to nui	IIdII
bank riparian		lots, roadbeds			zone only m	ıınımaliy	•	zone a grea	at deal.		activities.		
zone)		cuts, lawns, o	r crops)										
		have not impa	cted zone	<del>)</del> .				<u> </u>					
Score (LB)	8				<b>✓</b>								
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	8				<b>✓</b>								
		Right Bank	10	9	8	7	6	5	4	3	2	1	
TOTAL SCORE	98												

Project ID:	Somerville	South Ar	nendm	nent 2		Stream	Class	<b>S</b> :	Ephe	emeral				
Stream ID:	#23					Locatio	n:		Mack	cey, IN				
Lat:	38.23798	Long:		-87.35	101	River E	Basin:		Ohio	1				
Investigators:	Nate Nola	nd												
Ciamatura.				Date:		5-Ma	y-2011	1	Reas	on for Surve	<b>∍</b> y:			
Signature:				Time			2:2	26 PM	404 F	- unctional A	ssess	sment		
			•					•						
WEATHER		Current			Pa	st 24-H	ours			Heavy rain i	n las	t 7-day	s	
CONDITIONS		Storm (H	eavy Rai	n)		Storm (He	eavy Rair	n)		□no [	<b>✓</b> Yes			
		Rain Stea	ıdy			Rain Stea	dy			Air Temp °C	;	1	8	
		Showers	(Intermit	ttent)		Showers (	(Intermit	ttent)		Air Temp °F	.	6	<b>3</b> 5	
		Cloud Co	ver %		✓	Cloud Cov	er %		90	Other:				
		✓ Clear/Sur	nny			Clear/Sun	ny							
SITE LOCATION	ON/MAP	See Atta	chmer	nt										
STREAM		Stream Si	ubsvst	em					Strea	am Type				
CHARACTERI	ZATION	Perennial		Intermitt	ent F					Coldwater				
			_			Ерпенета				✓ Warmwater				
		Stream O	rain							Catchr	nent .	Area		
		Upland R	•		<b>✓</b> Mix	ture of Ori	nins			Mile <sup>2</sup>			.1	
		Spring-fe		d water	□we		Other			Km²		0	.3	
					<del></del>		_							
WATERSHED		Surround	ing La	nd use	& Per	centage	•	Loca	cal Watershed NPS Polluntion					
FEATURES		✓ Forest		100%	Comm	ercial		☐ No	No evidence Some potential sources					
		Field/Pas	ture		Other			<b>✓</b> Ob	Obvious sources Ag. induced sedimen				ment	
		Agricultur	re	_				Loca	l Wat	ershed Erosi	ion			
		Residenti	al					☐ Nor	ne 🔽	' Moderate	Heavy	/		
RIPARIAN		Indicate t	he don	ninant	tvne a	nd redo	rd the	domir	nant s	species pres	ent			
VEGETATION		Trees			rasses	Herbs		None	iuiit	species pies	CIIC			
(18 meter buff		Dominant	_				_		orast					
(10 meter ban	<u> </u>	Dominant	Орссі	C3. II	iixcu ii	ara arra	30111	nast it	01031					
INSTREAM		Est. Reach	n Leng	th	ft	139	m	42		Canopy Cov	/er			
FEATURES		Est. Strea	m Widt	h	ft		m	0.0		Open	Pa	rtly Oper	ı	
		Sampling			ft <sup>2</sup>	0	$m^2$	0		✓ Shaded	Pa	rtly Shad	ledC	
		Sampling .		ile <sup>2</sup>	mi	le <sup>2</sup> 0.0	$km^2$	0.0						
		Area in km	1 <sup>2</sup>		mi	le <sup>2</sup> 0.0	$km^2$	0.0		High Water Ma	ark	ft	0.00	
		Est. Water	Depth	1	in	0.5	m	0.0		High Water Ma	ark	m	0.00	
		Surface Vo	elocity		ft/s	0.2	m/s	0.1		% of Stream N	Morpho	ology		
									Rif	fle %	Run	%		
		Channeliz	ed 🔲	Yes [	✓ No				□ Ро	ol %	Glid	e Pool		
		Dam Pres	ent 🔲	Yes [	<b>✓</b> No				Ste	ep Pool Series				
I ARGE WOOD	<del></del>	LWD 0	0.0	m²	0	ft <sup>2</sup>								
LARGE WOOD	1			''' –	U	'`								
DEDIKIS		Density o	f I W/D	n	n²/km²	0.0	000000	იიიი		ft <sup>2</sup> /mile <sup>2</sup>	0.0	00000	0000	
		IDCIIGILY U	** *		: /KIII	0.0				1	٠.٠			

AQUATIO						•			ninant species p			
VEGETA	TION		✓ Rooted En	•		ooted Subm	•		Rooted Floating	None	е	
			Free Float	ting	L A	ttached Alg	ae		Floating Algae			
			Portion of t	the re	ach with	aquatic	vegetat	ion pr	resent		10 %	
WATER	QUALITY		Temperatu Conductivi Total Disso pH 7.5	ty	<b>13.1</b> °( μs/cm Solids		°F <b>97.4</b> mg/l	□N	<u> </u>	ewage naerobic	Petroleum	
			Turbidity Clear Opague		ight Turbid ained	H ∏Tur ☐Oth			ter Surface Oils Slick ☐ Sheen [ Other	Globs	Flecks	
SEDIMEN			Odors  Normal Chemica Other	al	Sewage	_	etroleum Ione			Other	·	
			Oils  Absent	П«	light [	☐Moderate	Пр	rofuse	Looking at stone embedded, are	unders		·
IN	IORGANIC	SUBS	STRATE CO						GANIC SUBSTR			
Substrate	T				e inSam		Subst		Characteris		% Compositi	on in
Type			'	-			T.,,				Sampling Re	
Type				Νe	ach		Тур	be			l Sambing we	ach
Bedrock				Ke	eacn		Detr		Sticks, wood, o	oarse	Jumping Ke	ach
	>10"			Ne	eacn				Sticks, wood, o		Jumping Ne	each
Bedrock Boulder Cobble	2.5 - 1	0"					Detr Mud	itus ck-	plant mater Black very f	ial ine	Sumpling ite	each
Bedrock Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" .5"			5		Detr Mud Mu	itus ck- ud	plant mater Black very fi organic mat	ial ine ter	Sumpling ite	each
Bedrock Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2 gritty	0" .5"			5 25		Detr Mud	itus ck- ud	plant mater Black very fi organic mat Grey, she	ial ine ter II	Sumpling ite	each
Bedrock Boulder Cobble Gravel Sand Silt	2.5 - 1 0.1 - 2 gritty gooe	0" .5" ,		2	5 25 65		Detr Mud Mu	itus ck- ud	plant mater Black very fi organic mat	ial ine ter II	Jumping Re	each
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick	0" .5" ,		2	5 25 65 5		Detr Mud Mu Ma	itus ck- ud arl	plant mater Black very fi organic mat Grey, she fragments	ial ine ter II		ach
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2 gritty gooe slick	0" .5" ,		2	5 25 65 5 <b>ABITAT</b>		Mud Mu Ma Ma	itus ck- ud arl	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S	ial ine ter II	ıs	each
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Para	2.5 - 1 0.1 - 2 gritty gooe slick oitat meter	0" 5" y	Optimal	2	5 25 65 5 <b>ABITAT</b>	ubOptima	Mud Mu Ma Ma	itus ck- ud arl	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S' Marginal	ial ine ter III S	ns Poor	each
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar  1. Epifaur	2.5 - 1 0.1 - 2 gritty gooe slick oitat meter nal	0" .5" .y	er than 50%	2 (	5 25 65 5 <b>ABITAT</b> St 30-50% fe	ubOptima or low	Mud Ma	itus ck- ud arl - LOV	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal	ial ine ter II S TREAN	//S Poor	each
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Parai 1. Epifaui Substrat	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	0" 5" y	er than 50% gradient strea	HA	5 25 65 5 <b>ABITAT</b> Su 30-50% fo	ubOptima or low streams) mi	Muc Muc Ma	itus ck- ud arl - LOV	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  % for low nt streams) mix of	ial ine tter II S TREAN 10% for low gra	Poor r dient streams)	each
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O" 5" y  Greate for low of subs	er than 50% gradient strea strate favorable	HA	5 25 65 5 ABITAT Su 30-50% for gradient s stable hal	or low streams) mi	Muc Mu Ma	ck- ud arl - LOV 10-30% gradier stable	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low nt streams) mix of habitat; habitat	ial ine ter III S TREAN 10% for low gra- stable h	Poor r dient streams) nabitat; lack of	each
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Parai  1. Epifaui Substrat	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O" 5" y  Greate for low of subs epifaur	er than 50% gradient strea strate favorable nal colonization	HA ams) e for n &	5 25 65 5 ABITAT Su 30-50% for gradient setable halfor full col	or low streams) min bitat; well-so	Mu Ma Ma Me	ck- ud arl  - LOV  10-30% gradier stable availab	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low nt streams) mix of habitat; habitat bility less than	ial ine ter II S TREAN 10% for low grastable habitat	Poor r dient streams) nabitat; lack of is obvious;	each
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O" 5"  Y  Greate for low of subs epifaur fish co	er than 50% gradient strea strate favorable nal colonization ver; mix of sna	HA ams) e for n & ags,	5 25 65 5 ABITAT Su 30-50% for gradient se stable half for full coll potential;	or low streams) mi bitat; well-si lonization adequate h	Muc Mu Ma Ma Ma Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-30% gradier stable availab desirat	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low Int streams) mix of habitat; habitat bile; substrate	ine ter III S TREAN 10% for low gra stable h habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or	each
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O" 5"  Y  Greate for low of subs epifaur fish cor subme	er than 50% gradient strea strate favorable nal colonization	HA ams) e for n & ags, dercut	5 25 65 5 ABITAT Su 30-50% for gradient setable had for full colpotential; for mainter	or low streams) min bitat; well-so	Muc Mu Ma	ck- ud arl  10-30% gradier stable availab desirat	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	ial ine ter II S TREAN 10% for low grastable habitat	Poor  dient streams) habitat; lack of is obvious; te unstable or	each
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Y  Greate for low of subsepifaur fish cosubme banks,	er than 50% gradient strea strate favorable nal colonization ver; mix of sna rged logs, und	HA ams) e for n & ags, dercut er	5 25 5 5 ABITAT Su 30-50% for gradient se stable half for full coll potential; for mainted population	or low streams) mi bitat; well-su lonization adequate h	Mu Ma Ma MeMENT al	ck- ud arl  10-30% gradier stable availab desirab frequen	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	ine ter III S TREAN 10% for low gra stable h habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or	each
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish cor subme banks, stable	er than 50% gradient strea strate favorable nal colonization ver; mix of sna rged logs, und cobble or othe	HA ams) e for n & ags, dercut er age	5 25 65 5 ABITAT Su 30-50% for gradient se stable half for full coll potential; for mainted population additional	or low streams) mi. bitat; well-su lonization adequate henance of ns; presence	Muc Mu Ma	ck- ud arl  10-30% gradier stable availab desirab frequen	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	ine ter III S TREAN 10% for low gra stable h habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or	each
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allow	er than 50% gradient strea strate favorable nal colonization ver; mix of sna rged logs, und cobble or othe habitat & at sta	HAMA  Amms) e for n & ags, dercut er age ion	5 25 65 5 ABITAT Su 30-50% for gradient se stable half for full coll potential; for mainted population additional	or low streams) mine bitat; well-su lonization adequate herance of ns; presence I substrate in	Muc Mu Ma	ck- ud arl  10-30% gradier stable availab desirab frequen	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	ine ter III S TREAN 10% for low gra stable h habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or	each
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish co subme banks, stable to allov potenti	er than 50% gradient streatestrate favorable nal colonization ver; mix of sna rged logs, und cobble or othe habitat & at sta w full colonizat	HAMA  Amms) e for n & ags, dercut er age tion mags	5 25 35 5 ABITAT Su 30-50% for gradient se stable half for full coll potential; for mainted population additional form of new yet preparations.	or low streams) mine bitat; well-su lonization adequate herance of ns; presence I substrate in	Muc Muc Muc Muc Mal Mal Mal Mal Mal Muc	ck- ud arl  10-30% gradier stable availab desirab frequen	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	ine ter III S TREAN 10% for low gra stable h habitat substra	Poor  dient streams) habitat; lack of is obvious; te unstable or	each
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Parai 1. Epifaui Substrat Available Cover	2.5 - 1 0.1 - 2 gritty gooe slick oitat meter nal e/	O"  5"  Y  Greate for low of subs epifaur fish co subme banks, stable to allov potenti that are	er than 50% gradient streate favorable nal colonization ver; mix of sna rged logs, und cobble or othe habitat & at sta v full colonizat ial (i.e., logs/sr	HAMA  Amms) e for n & ags, dercut er age tion mags	5 25 35 5 ABITAT Su 30-50% for gradient se stable half for full coll potential; for mainted population additional form of new yet preparations.	or low streams) mi. bitat; well-si lonization adequate henance of ns; presence I substrate i ewfall, but no ured for ion (may rate	Muc Muc Muc Muc Mal Mal Mal Mal Mal Muc	ck- ud arl  10-30% gradier stable availab desirab frequen	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	ine ter III S TREAN 10% for low gra stable h habitat substra	Poor r dient streams) nabitat; lack of is obvious; te unstable or	each
Bedrock Boulder Cobble Gravel Sand Silt Clay Hat Parar 1. Epifaur Substrat Available	2.5 - 1 0.1 - 2. gritty gooe slick oitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish co subme banks, stable to allow potenti that are not trai	er than 50% gradient streate favorable nal colonization ver; mix of sna rged logs, und cobble or othe habitat & at sta w full colonizat ial (i.e., logs/sr e not new fall a	HAMA  ams) e for n & ags, dercut er age tion hags and	5 25 30-50% for gradient set stable half for full collipotential; for mainted population additional form of new yet preparation colonization high end	or low streams) mi bitat; well-si lonization adequate h enance of ns; presence I substrate i ewfall, but n ared for ion (may rat of scale).	Muc Muc Muc Muc Mal Mal Mal Mal Mal Muc	ck- ud arl  10-30% gradier stable availab desirab frequen	plant mater Black very fi organic mat Grey, she fragments  W GRADINET S  Marginal  for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or ed.	ine ter III S TREAN 10% for low gra stable h habitat substra	Poor  r dient streams) habitat; lack of is obvious; te unstable or	ach 1 0

Г							
2. Pool	fixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no			
Substrate m	naterials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.			
Characterization fir	rm sand prevalent; root	dominant; some root mats	mat: no submerged				
m	nats and submerged	and submerged	vegetation.				
	•	vegetation present.					
Score 6							
L	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
3. Pool Variability	ven mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small			
	arge-deep, smallshallow,		more prevalent than deep	shallow or pools absent.			
	mall-deep pools present.		pools.	·			
Score 2 [							
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
<b>Deposition</b> o	of islands or point bars  nd less than <20% of  ne bottom affected by	bar formation, mostly from gravel, sand or fine	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools			
Score 17 [		deposition in pools.	deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	almost absent due to substantial sediment deposition.			
2	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
Status bo	oth lower banks, and animimal amount of	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.			
Score 3 [							
2	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
Alteration di	redging absent or print in the	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.			
	1	present.					
Score 17 [		present.					

7. Channel		The bends in t	the strean	n	The bends i	n the str	eam	The bends	in the str	eam	Channel stra	aight;			
Sinuosity		increase the s	tream		increase the	stream		increase th	e stream		waterway ha	is been			
		length 3 to 4 ti	mes long	er	length 2 to 3	3 times le	onger	length 1 to	2 times lo	onger	channelized	for a long	g		
		than if it was in	n a straigh	nt	than if it was	s in a str	aight	than if it wa	s in a str	aight	distance.				
		line. (Note - ch	nannel		line.			line.							
		braiding is cor	nsidered												
		coastal plains		r											
		normal low-lyi													
		this parameter	•												
		easily rated in													
		areas.)	111000												
Score 6	,	ПГ		$\overline{}$		пг		<del></del>		7 🔽		пп	$\neg$ $\neg$		
00010	,	20 19 1	.8 17	<u>1</u>	15 14	13	<u> </u>	 10	9 8	<u> </u>	6 5 4	<u></u>	2 1		
		20 19 1	.6 17	10	13 14	13	12 11	. 10	9 0		U J 4	·	2 1		
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable	; 30-	Unstable; m	any erod	ed areas;		
(score each ban	ık)	of erosion or b	ank failur	е	infrequent, s	small are	eas of	60% of ban	k in reacl	h has	"raw" areas	frequently	y along		
Note: determine left	or	absent or mini	mal; little		erosion mos	stly heale	ed	areas of er	osion; hig	h	straight sect	ions and	bends;		
right side by facing		potential for fu	iture		over. 5-30%	of bank	in	erosion pot	_		obvious ban				
downstream.		problems. <5%			reach has a			floods.	ŭ		60-100% of	J	٠ <i>,</i>		
		affected.			erosion.						erosional sc				
Score (LB)	3			$\overline{}$		П	$\Box$	$\vdash$	$\overline{}$	<b>V</b>					
000.0 (22)		Left Bank	10	9	8	7	6	<u></u>	4	3	2	1			
Score (RB)	3	LEIT Dalik		$\stackrel{\sim}{\vdash}$	$\stackrel{\circ}{\sqcap}$		$\overline{}$	$\overline{}$	$\overline{\Box}$	<u> </u>		$\overline{}$	$\Box$		
Score (IVD)	3	Diaht Dank	10	<u> </u>	<u> </u>	<u> </u>	<u>Ц</u>	<u></u>	<u> </u>		<u></u>		Ш		
		Right Bank	10	9	8	/	О	<u> </u>	4	3		1			
9. Vegetative		More than 90%	% of the		70-90% of tl	he strea	m-	50-70% of	the strear	n-	Less than 50	0% of the			
Protection (sc	ore	streambank si	urfaces ar	nd	-bank surfac	ces cove	red	bank surfac	es cover	ed	streambank	surfaces			
each bank)		immediate ripa	arian zone	es	by native ve	aetation	. but	by vegetati	on: disrur	otion	covered by v	/eaetatio	n:		
Note: determine left	or	covered by na			one class of	•		obvious; pa			1	•			
right side by facing		vegetation, inc			not well rep			soil or close			disruption of streambank vegetation is very high;				
downstream.		trees, underst	•	•	disruption e			vegetation			vegetation h		,		
downstream.			ory Siliub	5,						1622	removed to	as been			
		or nonwoody		_	affecting full			than one-ha		1-					
		macrophytes;	-	е	potential to			potential pl		ie	5 centimeter				
		disruption thro	_		extent; more			height rema	aining.		average stul	oble heig	ht.		
		grazing or mo	•		half of the p										
		minimal or not	evident;		stubble heig	tht rema	ining.								
		almost all plar	nts allowe	d											
		to grow natura	ally.												
Score (LB)	6						$\checkmark$								
		Left Bank	10	9	8	7	6	5	4	3	2	1			
Score (RB)	6						$\checkmark$								
		Right Bank	10	9	8	7	6	5	4	3	2	1			
40 Diversion												_	_		
10. Riparian		Width of ripari			Width of ripa	arian zoi	ne 12-	Width of rip		ne 6-	Width of ripa				
Vegstative Zor		>18 meters; h	uman		18 meters; h	numan		12 meters;	human		meters: little	or no rip	arian		
Width (score ea	ach	activities (i.e.,	parking		activities ha	ve impa	cted	activities ha	ave impad	cted	vegetation d	ue to hur	man		
bank riparian		lots, roadbeds	, clear-		zone only m	inimally	•	zone a grea	at deal.		activities.				
zone)		cuts, lawns, or	r crops)												
•		have not impa	cted zone	e.											
Score (LB)	8			$\overline{}$	<u> </u>	П	П	<del>'</del>	П			П			
		Left Bank	10	9	<u> </u>	<u> </u>	6	<u></u>	4	<u></u>		1			
Score (RB)	8	LCTC DUTIK		Ť	<u> </u>	$\stackrel{-}{\sqcap}$	$\overline{\Box}$	$\overline{}$		$\overline{}$		$\overline{}$	$\neg$		
(i.b)		Right Bank	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u></u>	1			
TOTAL SCORE	88	_				•			•						
I U I AL SUURE	00														

Project ID:	Somerville	South An	nendme	ent 2	Str	eam	Class	<b>:</b>	Ephe	emeral				
Stream ID:	#24			Lo	catio	n:		Mack	cey, IN					
Lat:	38.23823	Long:	-	87.35066	Riv	er Ba	asin:		Ohio					
Investigators:	Nate													
Signature:				Date:	5	5-May	/-2011		Reas	on for Sur	vey:			
Signature.				Time:			2:4	18 PM	404 F	unctional	Asses	sment		
WEATHER		Current			Past 2	24-Ho	urs			Heavy rain	n in las	t 7-day	'S	
CONDITIONS		Storm (He	eavy Rain)	)	Stor	m (Hea	avy Rair	n)		NO	✓ Yes	;		
		Rain Stea	dy		Rain	Stead	у			Air Temp	°C	1	18	
		Showers	(Intermitte	ent)	Show	wers (I	ntermit	tent)		Air Temp	°F	(	<b>3</b> 5	
		Cloud Cov	ver %		<b>✓</b> Clou	ıd Cove	er %		90	Other:	•			
		✓ Clear/Sun	nny		Clea	r/Sunn	ıy							
SITE LOCATION	ON/MAP	See Atta	chment	!										
STREAM		Stream Su	ubsvste	em					Strea	am Type				
CHARACTERI	IZATION	Perennial	-	termittent						Coldwater				
		_			Ерпенени					✓ Warmwater				
		Stream O	rain								hment	Area		
		Upland R	-	[J]	Mixture (	of Oria	inc			Mile			.01	
		Spring-fee			Wetland	_	Other			Km <sup>2</sup>		_	0.0	
		spring re-	a/ Ground	water	wedana		Other							
WATERSHED		Surround	ing Lan	d use & I	Percen	tage		Local	Wate	ershed NP	S Pollu	ıntion		
FEATURES		✓ Forest	1	1 <b>00%</b> 🔲 Co	mmercia	l		□No	eviden	ce 🔲 So	me poter	ntial sourc	es	
		Field/Past	ture	Otl	her			<b>✓</b> Obv	vious so	ources Ag.	induc	ed sedi	ment	
		Agricultur	e				_	Local	l Wate	ershed Erc	sion			
		Residentia	al					Nor	ne 🔽	' Moderate	Heav	'y		
RIPARIAN		Indicate ti	ha domi	inant tyn	a and r	odor	d tha	domir	ant c	species pre	scont			
VEGETATION		Trees		Grasse		Herbs		None	iaiit s	species pre	Sont			
(18 meter buff		<b>Dominant</b>	_	_			_		oraet					
(10 meter buil	CI)	Dominant	Opecie	S. WIIAC	u maru	and	3011 11	iiast it	Jiest					
INSTREAM		Est. Reach	n Length	1	ft	104	m	32		Canopy C	over			
FEATURES		Est. Strear	m Width		ft		m	0.0		Open	□ P.	artly Ope	n	
		Sampling I			ft <sup>2</sup>	0	$m^2$	0		✓ Shaded	☐ P	artly Shad	dedC	
		Sampling A	Area mil	le <sup>2</sup>	mile <sup>2</sup>	0.0	$km^2$	0.0						
		Area in km	1 <sup>2</sup>		mile <sup>2</sup>	0.0	$km^2$	0.0		High Water	Mark	ft	0.00	
		Est. Water	Depth		in		m	0.0		High Water	Mark	m	0.00	
		Surface Ve	elocity		ft/s	n/a	m/s	####		% of Stream	n Morph	ology		
			-						Rif	fle %	Rur	า %		
		Channelize	ed 🔲 Y	es 🔽 No	)				_	ol %		de Pool		
		Dam Prese	_	_						ep Pool Series				
LABOE WOOD		LWD		n² (	n 4	t <sup>2</sup>								
LARGE WOOD	T	LWD 0	).0 n		<u> </u>	ı								
DEBRIS		Daw - !!	C 1 14/2	2	2	0.00	00000	2000		421 2	^	000000	0000	
		Density of	TLWD	m²/k	m	U.UU	00000	JUUU		ft <sup>2</sup> /mile <sup>2</sup>	U.	000000	UUUU	

AQUATION VEGETA			Indicate  Rooted		ninant type t □Root				ninant spe ]Rooted Floa		esent ☑ Non∈	2	
			Free Flo	•		ched Alg	•		Floating Alg	•			
			Portion o	f the rea	ach with a	quatic	vegetat	tion pr	esent			0 %	
WATER (	QUALITY		Tempera Conduct		### °C µs/cm	n/a	°F	1	er Odors	Se		Petroleum	
			Total Dis	•	•		mg/l	. —	hemical	_	wage aerobic	Petroleum	1
No V	Vater Prese	ent	рН				] 5	٠,			ao. <b>00</b> .0		
			Turbidity					Wat	er Surface	Oils			
			Clear	Sli	ght Turbid	Tur	bid		Slick She	een	Globs	Flecks	
			Opague	Sta	ained	Oth	ner		Other				
SEDIMEN	NT/		Odors						Deposits				
SUBSTR	ATE		✓ Norm		Sewage		etroleum		Sludge			Paper fiber	Sand
			Chem	ical	Anaerobic		lone		Relic She	lls 📙	Other		
			Other						I ooking a	t stone	e whic	h are not de	anly
			Oils						_			ides black ir	
			✓ Absent	SI	ight 🔲 N	Moderate	. <b></b>	Profuse		Yes		No	
IN	ORGANIC	SUBS	STRATE	COMPO	DNENTS			ORG	SANIC SU	BSTRA	ATE C	OMPONEN	TS
Substrate	Diamet	er	% Co	-	e inSampl	ing	Subst		Chara	acteris	tic	% Compo	
Type				Re	ach		Ty		Official			Samplin	g Reach
Bedrock Boulder	>10"						Detr	itus	Sticks, w				
Cobble	2.5 - 10	O"					Mu	ck-	-	materi very fir			
Gravel	0.1 - 2.						Mu			ic matt			
Sand	gritty						Ma	arl		y, shell			
Silt	gooey	/		Ç	90				frag	gments			
Clay	slick			1	0								
Hab	oitat			HA	ABITAT AS	SSESS	MENT	- LO\	N GRADIN	NET ST	REAM	IS	
	meter		Optima	l	Sub	Optima	al		Marginal			Poor	
1. Epifaur			er than 50%		30-50% for l				% for low		10% for		
Substrate			gradient st		gradient stre	,			nt streams) m			dient streams)	
Available Cover	<del>)</del>		strate favora		stable habita for full coloni	-	uited		habitat; habit pility less than			abitat; lack of	
Covei		-	nal coloniza ver; mix of s		potential; ad		nahitat		ole; substrate			is obvious; te unstable or	
			erged logs, u	•	for maintena	•	abitat		ntly disturbed		lacking.		
			, cobble or c		populations;	presenc	e of	remove	•				
		stable	habitat & at	stage	additional su	ıbstrate i	n						
		to allov	w full coloniz	ation	form of newf	all, but n	ot						
		potent	ial (i.e., logs	/snags	yet prepared	l for							
			e not new fa	ll and	colonization		te at						
Score	1	not tra	nsient).		high end of s	scale).	1 —		$\overline{}$				
OCOI E	'	20	<u>⊔ ⊔</u> 19 18	<u>цц</u> 17 16	15 14	13	<u>.                                    </u>	<u></u> . 10	<u> </u>	<u>⊔ ⊔</u> 7	6 5	<u> 4</u> 3	2 1 0
				_, _10	15 17		- <b>-</b> ++		3 3		5 5	. 3	4

	<del></del>								
2. Pool	Mixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no					
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.					
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged						
	mats and submerged	and submerged	vegetation.						
	vegetation common.	vegetation present.							
Score 6									
•	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0					
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small					
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.					
	small-deep pools present.	few shallow	pools.						
Score 1									
1	20 19 18 17 16	15 14 13 12 11		6 5 4 3 2 1 0					
4.Sediment	Little or no enlargement	Some new increase in	Moderate deposition of	Heavy deposits of fine					
Deposition	of islands or point bars	bar formation, mostly	new gravel, sand or fine	material, increased bar					
	and less than <20% of	from gravel, sand or fine	new gravel, sand or fine material, increased bar sediment on old and new development; more than						
	the bottom affected by	sediment; 20-50% of the	bars; 50-80% of the	80% of the bottom					
	sediment deposition.	bottom affected; slight	bottom affected; sediment	changing frequently; pools					
		deposition in pools.	deposits at obstructions,	almost absent due to					
			constrictions, and bends;	substantial sediment					
			moderate deposition of	deposition.					
			pools prevalent.	ueposition.					
Score 18									
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0					
5. Channel Flow	Water reaches base of	Water fills >75% of the	Water fills 25-75% of the	Very little water in					
Status	both lower banks, and	available channel; or	available channel, and/or	channel and mostly					
Oldido	mimimal amount of	<25% of channel	riffle substrates are	present as standing pools.					
	channel substrate is	substrate is exposed.	mostly exposed.	prosent as standing pools.					
	exposed.	substrate is exposed.	mostry exposed.						
Score 1									
00010	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0					
	10 13 10 17 10	13 11 13 12 11	1 3 5 7						
6 Channal									
6. Channel	Channelization or	Some channelization	Channelization may be	Banks shored with gabion					
Alteration	Channelization or dredging absent or	Some channelization present, usually in areas	Channelization may be extensive; embankments	Banks shored with gabion or cement; over 80% of					
			1	ı					
	dredging absent or	present, usually in areas	extensive; embankments	or cement; over 80% of					
	dredging absent or minimal; stream	present, usually in areas of bridge abutments;	extensive; embankments or shoring structures	or cement; over 80% of the stream reach					
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past	extensive; embankments or shoring structures present on both banks;	or cement; over 80% of the stream reach channelized and disrupted.					
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e.,	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly					
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed					
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed					
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed					
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed					

7. Channel		The bends in t	the strean	n	The bends	in the str	eam	The bends	in the stre	am	Channel stra	aight;		
Sinuosity		increase the s	tream		increase th	e stream		increase th	e stream		waterway ha	is been		
		length 3 to 4 ti	imes long	er	length 2 to	3 times lo	onger	length 1 to	2 times lor	nger	channelized	for a long	g	
		than if it was in	n a straigh	nt	than if it wa	as in a str	aight	than if it wa	s in a stra	ight	distance.			
		line. (Note - ch	nannel		line.			line.						
		braiding is cor	nsidered											
		coastal plains		r										
		normal low-lyi												
		this parameter	Ū											
		easily rated in												
		areas.)	11000											
Score 6	•			П						1 🔽		пп	$\neg$ $\neg$	
00010	,	20 19 1	<u>.                                    </u>	<u>1</u> 6	15 14	13	<u> </u>	 10	9 8	<u></u> 7	6 5 4	<u></u>	2 1	
		20 19 1	.0 17	10	13 14	. 13	12 11	10	9 0		U J 4	·	2 1	
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable;	30-	Unstable; ma	any erod	ed areas;	
(score each ban	k)	of erosion or b	ank failur	е	infrequent,	small are	eas of	60% of ban	k in reach	has	"raw" areas frequently along			
Note: determine left	or	absent or mini	imal; little		erosion mo	stly heale	ed	areas of er	osion; high	ı	straight sections and bends;			
right side by facing		potential for fu	ıture		over. 5-30%	6 of bank	in	erosion pot	_		obvious bank sloughing;			
downstream.		problems. <5%			reach has a			floods.		5	60-100% of	J	٠ <i>,</i>	
		affected.			erosion.						erosional sc			
Score (LB)	7			$\overline{}$		$\overline{\checkmark}$	$\Box$	$\vdash$	$\overline{}$					
000.0 (22)	-	Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	7	Left Barik		ŕ	<del></del>	<u>\</u>	$\overline{}$		$\overline{\Box}$	$\overline{\Box}$		<del></del>		
Score (IVD)		Diah+ Dank	10	9	<u> </u>	7	<u>Ц</u>	<u></u>	4	3	<u></u>	 1		
		Right Bank	10	9	0		- 0	<u> </u>	-4		<u> </u>			
9. Vegetative		More than 90%	% of the		70-90% of	the strea	m-	50-70% of	the stream	-	Less than 50	0% of the		
Protection (sco	ore	streambank si	urfaces ar	nd	-bank surfa	ices cove	red	bank surfac	es covere	d	streambank	surfaces		
each bank)		immediate ripa	arian zone	es	by native v	egetation	, but	by vegetation	on; disrupt	ion	covered by v	/egetatio	n;	
Note: determine left	or	covered by na			one class o	•		obvious; pa	•		disruption of	•		
right side by facing		vegetation, inc			not well rep	•		soil or close			vegetation is			
downstream.		trees, underst	•	e	disruption 6			vegetation			vegetation h		,	
downstream.		or nonwoody	ory Siliub.	3,	affecting fu			than one-ha		CSS	removed to	as been		
		macrophytes;	voaststiv	^	•							o or loop	in	
		, ,	Ū	e	potential to			potential pla		;	5 centimeter			
		disruption thro			extent; mor			height rema	aining.		average stul	obie neig	nt.	
		grazing or mo	•		half of the									
		minimal or not	-		stubble hei	ght rema	ınıng.							
		almost all plar		d										
		to grow natura	ally.											
Score (LB)	8				<b>✓</b>									
		Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	8				V									
		Right Bank	10	9	8	7	6	5	4	3	2	1		
10. Riparian		Width of ripari	on 7000		Width of rip	orion zor	20.12	Width of rip	orion zona	. 6	Width of ripa	rion zon	2 46	
-							16 12-			, U-	-			
Vegstative Zor		>18 meters; h			18 meters;			12 meters;			meters: little			
Width (score ea	ach	activities (i.e.,	parking		activities ha	ave impa	cted	activities ha	ave impact	ed	vegetation d	ue to hur	man	
bank riparian		lots, roadbeds	, clear-		zone only r	minimally	-	zone a grea	at deal.		activities.			
zone)		cuts, lawns, or	r crops)											
		have not impa	cted zone	<del>)</del> .										
Score (LB)	8				<b>V</b>									
` ′		Left Bank	10	9	<u> </u>			_ <u></u>	4					
Score (RB)	8			$\overline{\Box}$	$\overline{\mathbf{V}}$		П		П	$\overline{\Box}$	П			
` '		Right Bank	10	9	8	7	6		4	3	2	1		
TOTAL SCORE	95				*		-			-				
. U I / L UUUNL	55	i												

Project ID:	Somerville	erville South Amendment 2					Stream Class:				Ephemeral				
Stream ID:	#25	2041				Lo	catio	n:		Mackey, IN					
Lat:	38.23831	Long:		-87.3	35022	Riv	er B	asin:		Ohio					
Investigators:	Will Wrigh	ıt													
Cianatura				Dat	e:	;	5-May	/-2011		Reas	on for Sur	vey:			
Signature:				Tim	e:			3:1	2 PM	404 Functional Assessment					
WEATHER		Current				Past 2	24-Ho	urs		Heavy rain in last 7-days					
CONDITIONS		Storm (H	Heavy Ra		Storm (Heavy Rain)				□ NO ✓ Yes						
		Rain Ste	ady		Rair	Stead	y			Air Temp <sup>c</sup>	Ç	•	18		
		Showers	(Interm		Sho	wers (I	ntermit	tent)		Air Temp <sup>c</sup>	°F		65		
		Cloud Co	over %			✓ Clou	ıd Cove	er %		90	Other:				
		✓ Clear/Su	ınny			Clear/Sunny									
OITE LOCATIO		0 44		4											
SITE LOCATION	JN/WAP	See Atta													
STREAM		Stream S	ubsys	tem						Strea	ım Type				
CHARACTER	IZATION	Perennia	al 🔲	Interm	ittent	✓Ep	hemer	al		Со	ldwater				
										<b>✓</b> wa	armwater				
		Stream C	rgin								Catc	hment	Area		
		Upland	Runoff		$\checkmark$	Mixture	of Orig	ins		Mile <sup>2</sup> 0.01					
		Spring-f	ed/Grour	nd wate	r 🔲	Wetland		Other			Km <sup>2</sup>		C	0.0	
WATERCHER		C	d:a. l a		0 [		4		1	ocal Watershed NPS Polluntion					
WATERSHED		Surround	ing La				_		_						
FEATURES		Forest		100%	_	mmercia	l		_	No evidence Some potential sources					
		Field/Pa			Oth	ier				Obvious sources Ag. induced sedimen cal Watershed Erosion					
		Agricultu						_				_			
		Resident	iiai						No	ne <u>L</u> ✓	Moderate	Heav	/y		
RIPARIAN		Indicate	the do	minar	nt type	and i	redor	d the	domii	nant s	species pre	esent			
VEGETATION		<b>✓</b> Trees	Shrub	os 🗌	Grasse	s 🔲	Herbs		None						
(18 meter buff	fer)	Dominan	t Spec	ies:	Soft	mast f	orest	:							
INSTREAM		Est. Read	h Lanc	ıth		ft	60	m	21		Canopy Co	ovor			
FEATURES		Est. Strea				ft	09	m	0.0		Open		artly Ope	n	
ILATORES		Sampling				ft <sup>2</sup>	0	m <sup>2</sup>	0.0		✓ Shaded		artly Shad		
		Sampling				mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		<b>V</b> S⊓aueu	ШР	artiy Silat	ueuc	
		Area in kr		0		mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water	Mark	ft	0.00	
		Est. Wate		h		in	0.0	m	0.0		High Water		m	0.00	
		Surface V	•			ft/s	0.0	m/s	0.0		% of Stream			0.00	
		Juliace V	Ciccity			.40	0.0	111/3	0.0	□ Di€	fle %	Rui	0.		
		Channeliz	zed □	Yes	✓ No					Poo			n % de Pool		
		Dam Pres	· · · · · · · · · · · · · · · · · · ·	res Yes	✓ No						p Pool Series		ue POOI		
			<u> </u>		<u>. 140</u>					316	h i ooi seiles				
LARGE WOOD DEBRIS	Y	LWD	0.0	m <sup>2</sup>	(	1	it²								
		Density o	m <sup>2</sup> /kr	n²	0.00	00000	0000	0000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000							

AQUATIO							ninant species pr		
VEGETA	TION		Rooted Emergent		•		_	✓ None	e
			Free Floating	Attached Alg	ae	L	Floating Algae		
			Portion of the re-	ach with aquatic	vegetat	ion pr	resent		0 %
WATER (	OLIAL ITY		Temperature	#### °C n/a	°F	\/\/at	er Odors		
WATER	QUALITI		Conductivity	µs/cm	Г	ı	lormal/None Se		Petroleum
			Total Dissolved		mg/l	' =	<u> </u>	wage aerobic	Petroleum
No W	Vater Prese	ent	pH	Collas	iiig/i	ПС	пениса Дан	aerobic	
110 1	valor i root	J116	<u> </u>						
			Turbidity				ter Surface Oils	_	
				ight Turbid 🔲 Tur		_		Globs	Flecks
			Opague St	ained Oth	er		Other		
SEDIMEN	NT/		Odors				Deposits		
SUBSTR	ATE		✓ Normal	Sewage P	etroleum		☐ Sludge ☐ Saw	dust [	Paper fiber Sand
			Chemical	Anaerobic N	one		Relic Shells	Other	
			Other						
							Looking at stone	s whic	h are not deeply
			Oils				embedded, are u	unders	ides black in color?
			Absent SI	light Moderate	☐ P	rofuse	Yes	ì	No
		SUBS	STRATE COMPO				SANIC SUBSTRA		1
Substrate	Diamet	er		e inSampling	Subst		Characteris	tic	% Composition in
Type			l Re	ach	Tyl	ne			Sampling Reach
									1 8
Bedrock			-		Detr		Sticks, wood, c		, G
Bedrock Boulder	>10"				Detr	itus	plant materi	al	, , , , , , , , , , , , , , , , , , ,
Bedrock Boulder Cobble	2.5 - 10	0"			Detr	itus ck-	plant materi Black very fil	al ne	The second secon
Bedrock Boulder Cobble Gravel	2.5 - 10 0.1 - 2.	0" 5"		5	Detr Mu Mu	itus ck- ud	plant materi Black very fii organic matt	al ne er	
Bedrock Boulder Cobble Gravel Sand	2.5 - 10 0.1 - 2. gritty	0" 5"	1	5	Detr	itus ck- ud	plant materi Black very fii organic matt Grey, shel	al ne er	7 7 3
Bedrock Boulder Cobble Gravel Sand Silt	2.5 - 10 0.1 - 2. gritty gooey	0" 5"	1	5 10 30	Detr Mu Mu	itus ck- ud	plant materi Black very fii organic matt	al ne er	
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 10 0.1 - 2. gritty gooey slick	0" 5"	1 8	5 10 30 5	Mud Mu Ma	itus ck- ud arl	plant materi Black very fii organic matt Grey, shel fragments	al ne er I	
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 10 0.1 - 2. gritty gooey slick	0" 5"	1 8 9	5 10 30 5 <b>ABITAT ASSESS</b>	Detr Mud Mu Ma	itus ck- ud arl	plant materi Black very fii organic matt Grey, shel fragments	al ne er I	AS.
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hab	2.5 - 10 0.1 - 2. gritty gooey slick bitat meter	0" 5" /	1 1 8 HA	5 10 30 5 ABITAT ASSESS SubOptima	Detr Mud Mu Ma	itus ck- ud arl	plant materi Black very fii organic matt Grey, shel fragments  W GRADINET ST	al ne er I	//S Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hab Parar  1. Epifaur	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter nal	0" 5" /	HAOptimal	5 10 30 5 ABITAT ASSESS SubOptima 30-50% for low	Mu Mu Ma Ma	itus ck- ud arl - LOV	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal	al ne ter l	//S Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	0" 5" / Greate	HA Optimal or than 50% gradient streams)	5 10 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix	Muc Mu Ma	itus ck- ud arl - LOV 10-30% gradier	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal 6 for low nt streams) mix of	REAM	AS Poor r dient streams)
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	0" 5"  /  Greate for low of subs	HA Optimal er than 50% gradient streams) strate favorable for	5 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mitstable habitat; well-su	Muc Mu Ma	ck- ud arl - LOV 10-30% gradier stable	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal  for low ht streams) mix of habitat; habitat	al ne ter l 10% for low gra- stable h	Poor r dient streams) nabitat; lack of
Bedrock Boulder Cobble Gravel Sand Silt Clay Hab Parar 1. Epifaur Substrate	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	O"  5"  Greate for low of subs epifaur	HA Optimal or than 50% gradient streams) strate favorable for hal colonization &	5 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-st	Mu Ma	ck- ud - LOV 10-30% gradier stable availab	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than	REAM 10% for low grastable habitat	Poor r dient streams) nabitat; lack of is obvious;
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	O"  5"  Greate for low of subsepifaur fish co	Optimal er than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags,	5 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mitstable habitat; well-su	Muc Mu Ma Ma Ma Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-30% gradier stable availab desirat	plant materi Black very fil organic matt Grey, shell fragments  W GRADINET ST Marginal % for low Int streams) mix of habitat; habitat bility less than ble; substrate	al ne ter l l l l l l l l l l l l l l l l l l l	Poor r dient streams) nabitat; lack of is obvious; tte unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	O"  5"  Greate for low of subs epifaur fish co subme	HA Optimal or than 50% gradient streams) strate favorable for hal colonization &	5 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mi: stable habitat; well-streams of full colonization potential; adequate h	Mu Ma	ck- ud arl  10-30% gradier stable availab desirat	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	REAM 10% for low grastable habitat	Poor r dient streams) nabitat; lack of is obvious; tte unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	O"  5"  Greate for low of subs epifaur fish co subme banks,	HA Optimal or than 50% gradient streams) strate favorable for nal colonization & ever; mix of snags, erged logs, undercut	5 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of	Mu Ma Ma Mental	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	al ne ter l l l l l l l l l l l l l l l l l l l	Poor r dient streams) nabitat; lack of is obvious; tte unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable	Optimal  The than 50%  gradient streams)  strate favorable for than colonization & the two streams of the two strates are the	5 10 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence	Muc Mu Ma Ma Ma Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	al ne ter l l l l l l l l l l l l l l l l l l l	Poor r dient streams) nabitat; lack of is obvious; tte unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	O"  5"  Greate for low of subs epifaur fish cor subme banks, stable to allow	The streams of the streams of the streams of the streams of the stream o	5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i	Muc Mu Ma Ma Ma Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	al ne ter l l l l l l l l l l l l l l l l l l l	Poor r dient streams) nabitat; lack of is obvious; tte unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	Greater for low of subsepifaur fish consubanks, stable to allow potenti	HA Optimal or than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, orged logs, undercut cobble or other habitat & at stage or full colonization	5 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-so for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n	Muc Mu Ma Ma Ma Ma Me MENT al Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	al ne ter l l l l l l l l l l l l l l l l l l l	Poor r dient streams) nabitat; lack of is obvious; tte unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	O"  5"  Greate for low of subs epifaur fish co subme banks, stable to allov potenti that are	The strate favorable for mal colonization & ver; mix of snags, arged logs, undercut cobble or other habitat & at stage w full colonization al (i.e., logs/snags	5 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix stable habitat; well-strong for full colonization potential; adequate he for maintenance of populations; presence additional substrate if form of newfall, but never the prepared for	Muc Mu Ma Ma Ma Ma Me MENT al Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	al ne ter l l l l l l l l l l l l l l l l l l l	Poor r dient streams) nabitat; lack of is obvious; tte unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 10 0.1 - 2. gritty gooey slick  bitat meter hal	O"  5"  Greate for low of subs epifaur fish co subme banks, stable to allov potenti that are	HA Optimal  Than 50%  gradient streams)  strate favorable for than colonization & the ver; mix of snags, the regard logs, undercut cobble or other thabitat & at stage to w full colonization than it.e., logs/snags to the not new fall and	5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for colonization (may rat	Muc Mu Ma Ma Ma Ma Me MENT al Ment Ment Ment Ment Ment Ment Ment Ment	ck- ud arl  10-30% gradier stable availab desirab frequer	plant materi Black very fil organic matt Grey, shel fragments  W GRADINET ST Marginal for low int streams) mix of habitat; habitat bility less than ble; substrate intly disturbed or	al ne ter l l l l l l l l l l l l l l l l l l l	Poor r dient streams) nabitat; lack of is obvious; tte unstable or

	7 7 7 7 7
2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: no
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged
	mats and submerged and submerged vegetation.
	vegetation common. vegetation present.
Score 6	
1	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small
,	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.
	small-deep pools present. few shallow pools.
Score 4	
-	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4.Sediment	Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine
Deposition	of islands or point bars bar formation, mostly new gravel, sand or fine material, increased bar
	and less than <20% of from gravel, sand or fine sediment on old and new development; more than
	the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom
	sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools
	deposition in pools. deposits at obstructions, almost absent due to
	constrictions, and bends; substantial sediment
	moderate deposition of deposition.
	pools prevalent.
Score 18	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
F. Channel Flow	We have the control of the control o
5. Channel Flow	Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in
Status	both lower banks, and available channel; or available channel, and/or channel and mostly
	mimimal amount of <25% of channel riffle substrates are present as standing pools.
	channel substrate is substrate is exposed. mostly exposed.
	exposed.
Score 1	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6. Channel	Channelization or Some channelization Channelization may be Banks shored with gabion
Alteration	dredging absent or present, usually in areas extensive; embankments or cement; over 80% of
	minimal; stream of bridge abutments; or shoring structures the stream reach
	with normal evidence of past present on both banks; channelized and disrupted.
	pattern. channelization, i.e., and 40 to 80% of stream Instream habitat greatly
	dredging, (greater than reach channelized and altered or removed
	past 20 yr) may be disrupted. entirely.
	present, but recent
	channelization is not
	present.
Score 18	
10	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
	20 13 10 17 10 13 14 13 12 11 10 3 6 7 0 3 4 3 2 1 0

7. Channel		The bends in t	he stream	The ben	ids in the st	ream	The bends	in the strea	ım	Channel stra	iight;		
Sinuosity		increase the s	tream	increase	increase the stream			e stream		waterway has been channelized for a long			
		length 3 to 4 ti	mes longe	r length 2	to 3 times	longer	length 1 to	2 times lon	ger	channelized	for a long	g	
		than if it was ir	n a straight	than if it	was in a st	raight	than if it wa	s in a strai	ght	distance.			
		line. (Note - ch	nannel	line.			line.		-				
		braiding is con	sidered										
		coastal plains											
		normal low-lyin											
		this parameter	•										
		easily rated in											
		areas.)											
Score	<u> </u>	П Г	1	<del>-                                    </del>					1 🖂			$\neg$ $\neg$	
00010		20 19 1	<u></u> .8 17	<u> </u>	<u> </u>	<u> </u>	 10	9 8	<u>7</u>	6 5 4	<u> </u>	2 1	
		20 19 1	0 17	10 13	14 13	12 11	. 10 I	9 0	<u>′</u>	0 3 <del>4</del>		2 1	
8. Bank Stabil	ity	Banks stable;	evidence	Moderat	tely stable;		Moderately	unstable;	30-	Unstable; ma	any erode	ed areas;	
(score each bar	ık)	of erosion or b	ank failure	infreque	nt, small ar	eas of	60% of ban	k in reach	has	"raw" areas t	frequently	/ along	
Note: determine lef	t or	absent or mini	mal; little	erosion	mostly heal	led	areas of ero	osion; high		straight secti	ions and	bends;	
right side by facing		potential for fu	ture	over. 5-3	30% of ban	k in	erosion pot	ential durin	g	obvious ban	k sloughi	ng;	
downstream.		problems. <5%	6 of bank	reach ha	as areas of		floods.			60-100% of I	bank has		
		affected.		erosion.						erosional sca	ars.		
Score (LB)	3		ПГ	7				П	П		П		
,		Left Bank	10	9 8	7	6	5	4	3	2	1		
Score (RB)	3			1 1	$\neg \neg$	$\overline{}$			П		П		
000.0 (1.12)		Right Bank	<u> </u>	98	<u></u>	<u> </u>	 5	4	3		1		
		Mgnt bank		<del>,                                    </del>			T	<u> </u>		<u> </u>			
9. Vegetative		More than 90%	% of the	70-90%	of the stream	am-	50-70% of t	he stream-		Less than 50	)% of the		
Protection (sc	ore	streambank su	urfaces and	d -bank su	urfaces cov	ered	bank surfac	es covered	t	streambank	surfaces		
each bank)		immediate ripa	arian zones	by nativ	e vegetatio	n, but	by vegetation	on; disrupti	on	covered by vegetation;			
Note: determine lef	t or	covered by na	tive	one clas	s of plants	is not	obvious; pa	tches of ba	are	disruption of streambank			
right side by facing		vegetation, inc	luding	not well	represente	d	soil or close	ely cropped		vegetation is	very hig	h;	
downstream.		trees, understo	ory shrubs,		on evident b		vegetation	common; le	ess	vegetation h	as been		
		or nonwoody	•		g full plant g		than one-ha	alf of the		removed to			
		macrophytes;	vegetative		I to any gre		potential pla	ant stubble		5 centimeter	s or less	in	
		disruption thro	-	l'	more than c		height rema			average stub			
		grazing or mov		· · · · · ·	ne potential								
		minimal or not	•		height rema	•							
		almost all plan	•	01000.0		g.							
		to grow natura											
Score (LB)	8	to grow matara	,. П Г	<del>-                                    </del>				П	П		$\overline{}$	$\neg$	
Occit (LB)	_	Left Bank	10	<u> </u>	<u></u>	6		4	3		1		
Score (RB)	8	LCTC Darik	ПГ	<del>, ,</del>		$\overline{\Box}$	$\overline{\Box}$	$\overline{\Box}$	一		一		
Ocole (IXD)	0	Right Bank	<u> </u>	<u> </u>	<u></u>	<u> </u>		<u> </u>	<u> </u>		<u> </u>		
		Mgnt bank		<del>,                                    </del>			T	<u> </u>		<u> </u>			
10. Riparian		Width of riparia	an zone	Width of	f riparian zo	ne 12-	Width of rip	arian zone	6-	Width of ripa	rian zone	e <6	
Vegstative Zo	ne	>18 meters; hi	uman	18 mete	rs; human		12 meters;	human		meters: little	or no rip	arian	
Width (score e	ach	activities (i.e.,	parking	activities	s have impa	acted	activities ha	ve impacte	ed	vegetation d	ue to hur	nan	
bank riparian		lots, roadbeds	-		ly minimally		zone a grea			activities.			
zone)		cuts, lawns, or			.,	, -	a groc						
20116)		,	• /										
Coore (I D)	_	have not impa	cted zone.	<del>-                                    </del>				_	_			$\vdash$	
Score (LB)	8	:	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>Ц</u>		<u> </u>	Ш	
0 (75)	_	Left Bank	10	9 8	7	6	5	4	3	2	1		
Score (RB)	8							<u> </u>			Щ		
		Right Bank	10 9	9 8	7	6	5	4	3	2	1		
TOTAL SCORE	93												

Project ID:	Somerville South Amendment				Stream Class:				Ephemeral						
Stream ID:	#26(60)				Lo	catio	n:		Mackey, IN						
Lat:	38.23791	Long:	-87	7.34995	Riv	er B	asin:		Ohio	)					
Investigators:	Josh Iddir	ngs													
Signature:			D	ate:		5-May	/-2011		Reason for Survey:						
Oigilatare.			Ti	me:			2:5	4 PM	M 404 Functional Assessment						
_		Ī			•					T					
WEATHER		Current			Past 2	_	-			Heavy rai		-	'S		
CONDITIONS			eavy Rain)				avy Rair	1)		□NO	✓ Yes				
		dy		Rair		•			Air Temp			18			
		Showers	-	t)		-	ntermit	tent)		Air Temp	°F		65		
		Cloud Cov			☑ Clou				90	Other:					
		✓ Clear/Sun	ny		Clea	ır/Sunr	ıy								
SITE LOCATION	SITE LOCATION/MAP See Attachme									<u> </u>					
									_						
	STREAM Stream Subsys CHARACTERIZATION Perennial									am Type					
CHARACTERI	☐ Inte	rmittent	<b>✓</b> Ep	hemer	al			oldwater							
									∠ W	armwater		_			
		Stream O	_	_					Catchment Area						
		Upland R		_	Mixture	_			Mile <sup>2</sup> 0.01 Km <sup>2</sup> 0.0						
		Spring-fee	d/Ground wa	iter	Wetland	Ц	Other			KM		0	0.0		
WATERSHED		Surroundi	ing Land	use & F	ercen	tage		Loca	l Wat	ershed NP	S Pollu	ıntion			
FEATURES		✓ Forest	100	<b>0%</b> □ Co	mmercia	I		□No	No evidence ☐ Some potential sources						
		☐ Field/Past	ure	Otl	her			<b>✓</b> Ob	vious s	ources Ag.	induc	ed sedi	ment		
		Agricultur	е					Loca	l Wat	ershed Erc	osion				
		Residentia	al					☐ No	ne 🔽	' Moderate	Heav	/y			
RIPARIAN		Indicate th	ne domin	ant tyn	a and i	radar	d the	domii	nant c	species pro	eent				
VEGETATION		Trees		Grasse		Herbs		None	ilalit s	species pro	CSCIIL				
(18 meter buff		Dominant		_	ュ d hard		_		orest						
,							-								
INSTREAM		Est. Reach			ft		m	0		Canopy C					
FEATURES		Est. Strear			ft		m 2	0.0		Open		artly Oper			
		Sampling I			ft <sup>2</sup>	0	$m^2$	0		✓ Shaded	L P	artly Shac	ledC		
		Sampling /		_	mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0							
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water		ft	0.00		
		Est. Water	•		in	1.0	m	0.0		High Water		m	0.00		
		Surface Ve	elocity		ft/s	0.0	m/s	0.0	_	% of Stream					
				_						fle %	Rui				
		Channelize	_						=	ol %	Glid	de Pool			
		Dam Prese	ent Yes	✓ No	1				St∈	ep Pool Series					
LARGE WOOD	Y	LWD 0	.0 m²		01	ft <sup>2</sup>									
	f I WD	m²/k	m²	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	n	იიიიი	0000				

AQUATI	С		Indicate the dom	ninant type and re	cord th	ne don	ninant species pr	esent	
VEGETA	TION		✓ Rooted Emergent	t Rooted Subm	ergent		Rooted Floating	☐ None	2
			☐ Free Floating	Attached Alga	ae		Floating Algae		
			Portion of the re	ach with aquatic v	/egetat	tion pr	esent		5 %
				•					9 70
WATER	QUALITY		Temperature	14.4 °C 58		1	er Odors		_
			Conductivity	μs/cm	51.8	. —	ormal/None Se	•	Petroleum
			Total Dissolved	Solids 37.8	mg/l	ЦС	hemical An	aerobic	
			рН <b>5.9</b>						
			Turbidity			Wat	er Surface Oils		
			✓ Clear Sli	ght Turbid	bid		Slick Sheen	Globs	Flecks
			Opague St	ained Oth	er		Other		
SEDIME	NT/		Odors				Deposits		
SUBSTR	ATE		✓ Normal	Sewage Pe	etroleum		Sludge Sawd	dust _	Paper fiber Sand
			Chemical	Anaerobic N	one		Relic Shells	Other	
			Other						
							Looking at stone	s whic	h are not deeply
			Oils						des black in color?
			Absent SI	<u> </u>	P	Profuse	Yes		No
		SUBS	STRATE COMPO				SANIC SUBSTRA	1	
Substrate	Diamet	er	-	e inSampling	Subst		Characteristic		% Composition in
Type			Re	ach	Ty				Sampling Reach
Bedrock	4.0"				Detr	itus	Sticks, wood, co		
Boulder	>10"				N 4	ماد	plant materi		
Crovel	2.5 - 10 0.1 - 2.			5	Mu		Black very fir		
Gravel Sand	gritty			5	Mu Ma		organic matt Grey, shell		
Silt	gooey			60	IVIC	ali	fragments		
Clay	slick			10			nagmonto		
	bitat			ABITAT ASSESS	MENT	10	N CDADINET ST	DEAM	ie
	meter		Optimal	SubOptima		- <u>LO</u>	Marginal	ILAIV	Poor
1. Epifau		Greate	er than 50%	30-50% for low	41	10-309	% for low	10% for	
Substrat			gradient streams)	gradient streams) mix	x of		nt streams) mix of		dient streams)
Available			strate favorable for	stable habitat; well-su		ľ	habitat; habitat		abitat; lack of
Cover		epifaur	nal colonization &	for full colonization		availab	pility less than		s obvious;
							ole; substrate	cuhetra	te unstable or
		fish co	ver; mix of snags,	potential; adequate h	abitat	desiral	oic, substrate	Substia	ie urisiable ui
			ver; mix of snags, rged logs, undercut	potential; adequate h for maintenance of			ntly disturbed or	lacking.	te unstable of
		subme		ľ			ntly disturbed or		le unstable of
		subme banks,	rged logs, undercut	for maintenance of	e of	freque	ntly disturbed or		le unstable of
		subme banks, stable	rged logs, undercut	for maintenance of populations; presence	e of n	freque	ntly disturbed or		le unstable of
		subme banks, stable to allow	rged logs, undercut cobble or other habitat & at stage	for maintenance of populations; presence additional substrate in	e of n	freque	ntly disturbed or		le unstable of
		subme banks, stable to allow potenti	rged logs, undercut cobble or other habitat & at stage v full colonization	for maintenance of populations; presence additional substrate in form of newfall, but n	e of n ot	freque	ntly disturbed or		le unstable of
Score	1	subme banks, stable to allow potenti that are	rged logs, undercut cobble or other habitat & at stage v full colonization al (i.e., logs/snags	for maintenance of populations; presence additional substrate in form of newfall, but no yet prepared for	e of n ot	freque	ntly disturbed or		e unstable of

		1					
2. Pool	Mixture of substrate Mix	xture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no			
Substrate	materials, with gravel and or o	clay; mud may be	bottom: little or no root	root mat or vegetation.			
Characterization	firm sand prevalent; root dor	minant; some root mats	mat: no submerged				
	mats and submerged and	d submerged	vegetation.				
	vegetation common. veg	getation present.					
Score 6							
	20 19 18 17 16 1	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
3. Pool Variability	Even mix of largeshallow, M	lajority of pools	Shallow pools much	Majority of pools small			
	-		more prevalent than deep	shallow or pools absent.			
			pools.				
Score 1							
00010	20 19 18 17 16 1	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
	20 13 18 17 10 1	13 14 13 12 11	10 5 6 7	0 3 4 3 2 1 0			
4.Sediment	Little or no enlargement Sor	me new increase in	Moderate deposition of	Heavy deposits of fine			
Deposition	of islands or point bars ba	ar formation, mostly	new gravel, sand or fine	material, increased bar			
	and less than <20% of from	m gravel, sand or fine	sediment on old and new	development; more than			
	the bottom affected by sec	diment; 20-50% of the	bars; 50-80% of the	80% of the bottom			
	sediment deposition. bot	ttom affected; slight	bottom affected; sediment	changing frequently; pools			
	·	. 6	deposits at obstructions,	almost absent due to			
		· '	constrictions, and bends;	substantial sediment			
			·	deposition.			
			pools prevalent.	deposition.			
Score 16		<del></del>		<del></del>			
Score 10		15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
	20 19 18 17 10 1	13 14 13 12 11	10 9 8 7	0 3 4 3 2 1 0			
5. Channel Flow	Water reaches base of Wa	ater fills >75% of the	Water fills 25-75% of the	Very little water in			
Status	both lower banks, and ava	ailable channel; or	available channel, and/or	channel and mostly			
	mimimal amount of <25	5% of channel	riffle substrates are	present as standing pools.			
	channel substrate is sub	bstrate is exposed.	mostly exposed.				
	exposed.	•	, ,				
Score 3		<del> </del>					
	20 19 18 17 16 1	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
6. Channel	Channelization or Sor	me channelization	Channelization may be	Banks shored with gabion			
Alteration	dredging absent or pre	esent, usually in areas	extensive; embankments	or cement; over 80% of			
	minimal; stream of b	bridge abutments;	or shoring structures	the stream reach			
	with normal evice	idence of past	present on both banks;	channelized and disrupted.			
	pattern. cha	annelization, i.e.,	and 40 to 80% of stream	Instream habitat greatly			
	dre	edging, (greater than	reach channelized and	altered or removed			
	pas	st 20 yr) may be	disrupted.	entirely.			
	pre	esent, but recent					
		annelization is not					
		esent.					
Score 18							
		15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
L							

7. Channel		The bends in t	the stream	n	The bends	in the str	eam	The bends	in the stre	am	Channel stra	iight;		
Sinuosity		increase the s	tream		increase th	e stream		increase th	e stream		waterway has been channelized for a long			
		length 3 to 4 ti	mes long	er	length 2 to	3 times lo	onger	length 1 to	2 times lor	nger	channelized	for a long	g	
		than if it was in	n a straigh	nt	than if it wa	as in a str	aight	than if it wa	s in a stra	ight	distance.			
		line. (Note - ch	nannel		line.			line.						
		braiding is cor	nsidered											
		coastal plains												
		normal low-lyin												
		this parameter	•											
		easily rated in												
		areas.)												
Score	<u> </u>	ПГ		$\overline{\Box}$		ПГ		<del>'</del>	ПГ	1 🔽				
00010		20 19 1	.8 17	<u>1</u>	15 14	<u>                                   </u>	<u></u> 12 11	 10	9 8	<u></u> 7	6 5 4	<u>— —</u> З	2 1	
		20 19 1	.6 17	10	13 14	+ 13	12 13	10	9 0		0 3 <del>4</del>		2 1	
8. Bank Stabil	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable;	30-	Unstable; ma	any erod	ed areas;	
(score each bar	ık)	of erosion or b	ank failur	е	infrequent,	small are	eas of	60% of ban	k in reach	has	"raw" areas t	frequently	y along	
Note: determine left	t or	absent or mini	mal; little		erosion mo			areas of er	osion; high	ı	straight secti	ions and	bends;	
right side by facing		potential for fu			over. 5-30%	% of bank	in	erosion pot	_		obvious banl			
downstream.		problems. <5%			reach has			floods.		J	60-100% of l	J	J,	
- · · - <del>- · · · ·</del>		affected.			erosion.						erosional sca			
Score (LB)	7			$\neg$		$\overline{\mathbf{V}}$		$\vdash$	$\overline{}$				$\neg$	
000.0 (25)	•	Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	7	Left Darik		Ť	$\overline{}$	<u> </u>	$\overline{}$		$\overline{\Box}$	$\overline{\Box}$		<del></del>	$\overline{\Box}$	
Score (IVD)	,	Diah+ Dank	<u> </u>	9	<u> </u>	<u> </u>	<u>Ц</u>	<u></u>	4	3	<u></u>	<u> </u>	Ш	
		Right Bank	10	9	0		- 0	<u> </u>	-4		<u>_</u>			
9. Vegetative		More than 90%	% of the		70-90% of	the strea	m-	50-70% of	the stream	-	Less than 50	% of the		
Protection (sc	ore	streambank su	urfaces ar	nd	-bank surfa	aces cove	red	bank surfac	es covere	d	streambank	surfaces		
each bank)		immediate ripa	arian zone	es	by native v	egetation	, but	by vegetation	on; disrupt	ion	covered by v	egetatio	n;	
Note: determine left	t or	covered by na	tive		one class of	of plants is	s not	obvious; pa	tches of b	are	disruption of streambank			
right side by facing		vegetation, inc			not well rep	•		soil or close			vegetation is			
downstream.		trees, underst	•		disruption 6			vegetation			vegetation h		,	
downstream.		or nonwoody	ory ormabi	٠,	affecting fu			than one-ha		000	removed to	do been		
		macrophytes;	voqotativ	_	potential to			potential pla			5 centimeter	e or loce	in	
			-	-						,				
		disruption thro	_		extent; moi			height rema	alling.		average stub	bble fleig	iit.	
		grazing or mo	•		half of the									
		minimal or not			stubble hei	gnt rema	ınıng.							
		almost all plan		d										
- " - \		to grow natura	ally.											
Score (LB)	8			<u>_</u>	<u> </u>	Щ_		<u> </u>	Ц	Ц_				
· (55)		Left Bank	10	9	8		6	5	4	3	2	1_		
Score (RB)	8		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	Ш	
		Right Bank	10	9	8	7	6	5	4	3	2	1		
10. Riparian		Width of ripari	an zone		Width of rip	oarian zor	ne 12-	Width of rip	arian zone	e 6-	Width of ripa	rian zone	e <6	
Vegstative Zo	nΔ	>18 meters; h			18 meters;			12 meters;			meters: little			
•		-						·						
Width (score e	acn	activities (i.e.,	-		activities ha			activities ha		ed	vegetation d	ue to hur	nan	
bank riparian		lots, roadbeds	, clear-		zone only r	minimally.		zone a grea	at deal.		activities.			
zone)		cuts, lawns, or	r crops)											
		have not impa	cted zone	).										
Score (LB)	8				V									
		Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	8				<b>V</b>									
		Right Bank	10	9	8	7	6	5	4	3	2	1		
TOTAL SCORE	97										-			

Project ID:	Somerville	Somerville South Amendment 2					Stream Class:				Ephemeral				
Stream ID:	#26(61)	· , , , , , , , , , , , , , , , , , , ,				Lo	catio	n:		Mack	cey, IN				
Lat:	38.23844	Long:		-87.3	5014	Riv	/er Ba	asin:		Ohio					
Investigators:	Nate Nola	nd													
Cianatura				Date	e:	,	5-May	/-2011		Reas	on for Surv	vey:			
Signature:				Tim	e:			2:5	59 PM	404 Functional Assessment					
WEATHER		Current				Past 2	24-Ho	urs		Heavy rain in last 7-days					
CONDITIONS		Storm (H		Storm (Heavy Rain)				□ NO ✓ Yes							
		Rain Stea		Rair	n Stead	у			Air Temp °	Č	•	18			
		Showers		Sho	wers (I	ntermit	tent)		Air Temp °	'F	(	65			
		Cloud Co	ver %			✓ Clou	ud Cove	er %		90	Other:				
		✓ Clear/Sur	nny			Clear/Sunny									
OITE LOCATIO		0 44-	-	4											
SITE LOCATION	JN/WAP	See Atta													
STREAM		Stream S	ubsyst	tem						Strea	am Type				
CHARACTERI	IZATION	Perennial		Intermi	ttent	✓Ep	hemer	al		Со	ldwater				
										<b>✓</b> w	armwater				
		Stream O	rgin								Catch	nment	Area		
		Upland R	unoff		abla	Mixture	of Orig	ins		Mile <sup>2</sup> 0.02					
		Spring-fe	d/Groun	d watei		Mixture of Origins  Wetland Other					Km <sup>2</sup>		0	).1	
WATEROUER		0	• •				4			ocal Watershed NPS Polluntion					
WATERSHED		Surround	ıng La				_		_						
FEATURES		Forest		100%	_	mmercia	I		_	No evidence Some potential sources					
		Field/Pas			Oth	ner				Obvious sources Ag. induced sediment cal Watershed Erosion					
		Agricultu						_							
		Residenti	al						Nor	ne <u></u> ✓	Moderate	Heav	/y		
RIPARIAN		Indicate t	he dor	ninan	t type	e and	redor	d the	domir	nant s	species pre	sent			
VEGETATION		✓ Trees	Shrub	s $\square$	Grasse	s $\square$	Herbs		None						
(18 meter buff	fer)	Dominant	Spec	ies:	Mixe	d hard	and	soft n	nast fo	orest					
INICEDEAM		Fat Dasal		41-		4	400		4.40		0				
INSTREAM		Est. Reacl					468		143		Canopy Co				
FEATURES		Est. Strea				ft ft <sup>2</sup>	0	m m²	0.0		Open		artly Ope		
		Sampling Sampling				mile <sup>2</sup>	0 0.0	km <sup>2</sup>	0		✓ Shaded	⊔Р	artly Shad	dedC	
		Area in km		IIIE		mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		1 I: l- 10/ t 1	N 4 =l .	£,	0.00	
							0.0		0.0		High Water I		ft	0.00	
		Est. Water				in "'-	/	m	0.0		High Water I		m	0.00	
		Surface V	elocity			ft/s	n/a	m/s	####		% of Stream		0,		
		Chara al'	—							_	fle %	Rui			
		Channeliz		Yes	✓ No					_	ol %	∐ Glid	de Pool		
		Dam Pres	ent	Yes	<b>✓</b> No					St∈	ep Pool Series				
LARGE WOOD	Υ	LWD_C	).1	m <sup>2</sup>	1	<u>1</u>	ft <sup>2</sup>								
		Density of LWD m					km² 0.000000092				9 ft²/mile² 0.000000359				

AQUATIO	3		Indicate the do	minant type and re	ecord th	e don	ninant species pro	esent	
VEGETA	TION		✓ Rooted Emerger	nt Rooted Subr	nergent		Rooted Floating	None	<b>)</b>
			☐ Free Floating	Attached Alg	jae		Floating Algae		
			Portion of the re	each with aquatic	vogotot	ion nr	ocont		20 %
			Fortion of the R	acii wiiii aqualic	vegetat	ion pi	eseni		20 / / / / /
WATER	QUALITY		Temperature	#### °C <u>n/a</u>	°F	Wat	er Odors		
			Conductivity	μs/cm		□N	ormal/None Sev	Petroleum	
			Total Dissolved	Solids	mg/l	□с	hemical An	aerobic	
No V	Vater Prese	ent	рН		_				
			Turbidity			\/\/at	er Surface Oils		
				ilight Turbid 🔲 Tu	rbid			Globs	Flecks
			I= =	stained Otl			olicksneen Other	_ Globs	☐ FIECKS
			орадиез	stainedOti	iei		otrici		
SEDIME	NT/		Odors				Deposits		
SUBSTR	ATE		✓ Normal	Sewage F	etroleum		Sludge Sawo	·	Paper fiber Sand
			Chemical	Anaerobic I	None		Relic Shells	Other	
			Other						
							Looking at stone	s whicl	h are not deeply
			Oils				•	ındersi	des black in color?
			Absent :	Slight Moderate	e DP	rofuse	Yes		□No
IN	ORGANIC	SUBS	STRATE COMP	ONENTS		ORG	SANIC SUBSTRA	ATE CO	OMPONENTS
Substrate	Diamet	ter	% Composi	te inSampling	Subst	rate	Characteris	tic	% Composition in
Type			R	each	Туј	Эе			Sampling Reach
Bedrock					Detr	itus	Sticks, wood, co	oarse	
Boulder	>10"						plant materia	al	
Cobble	2.5 - 10	0"			Mud	ck-	Black very fir	ne	
Gravel	0.1 - 2.	5"			Mι	ıd	organic matt	er	
Sand	gritty	•		5	Ma	arl	Grey, shell		
Silt	gooey	y		85			fragments		
Clay	slick			10					
Hal	oitat		Н	ABITAT ASSESS	SMENT	- LOV	W GRADINET ST	REAM	IS
Para	meter		Optimal	SubOptim	al		Marginal		Poor
1. Epifauı	nal	Greate	er than 50%	30-50% for low		10-30%	% for low	10% for	
Substrat	e/	for low	gradient streams)	gradient streams) m	ix of	gradier	nt streams) mix of	low grad	dient streams)
Available	•	of subs	strate favorable for	stable habitat; well-s	uited	stable	habitat; habitat	stable h	abitat; lack of
Cover		epifaur	nal colonization &	for full colonization		availab	oility less than	habitat i	s obvious;
		fish co	ver; mix of snags,	potential; adequate	nabitat	desirat	ole; substrate	substrat	te unstable or
			erged logs, undercut	for maintenance of		freque	ntly disturbed or	lacking.	
		banks,	cobble or other	populations; present	ce of	remove	ed.		
		stable	habitat & at stage	additional substrate	in				
			w full colonization	form of newfall, but i	not				
		potenti	ial (i.e., logs/snags	yet prepared for					
			e not new fall and	colonization (may ra	te at				
			nsient).	high end of scale).					
0		<b>_</b>							
Score	2								
Score	2	20	19 18 17 1		]	10	<u> </u>	<u>Ы</u> <u>L</u> 6 5	<u> </u>
Score	2	20	19 18 17 1	6 15 14 13	12 11	10	) 9 8 7	6 5	

			I				
2. Pool	Mixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no			
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.			
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged				
	mats and submerged	and submerged	vegetation.				
	vegetation common.	vegetation present.					
Score 6							
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small			
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.			
	small-deep pools present.	few shallow	pools.				
Score 2							
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
4.Sediment	little on an enlandament	Carra manufarana ia	Madagata dagaaitiaa af	llanus dan acita af fina			
Deposition	Little or no enlargement	Some new increase in	Moderate deposition of	Heavy deposits of fine			
Deposition	of islands or point bars	bar formation, mostly	new gravel, sand or fine	material, increased bar			
	and less than <20% of	from gravel, sand or fine	sediment on old and new	development; more than			
	the bottom affected by	sediment; 20-50% of the	bars; 50-80% of the	80% of the bottom			
	sediment deposition.	bottom affected; slight	bottom affected; sediment	changing frequently; pools			
		deposition in pools.	deposits at obstructions,	almost absent due to			
			constrictions, and bends;	substantial sediment			
			moderate deposition of	deposition.			
Seems 17			pools prevalent.				
Score 17	20 19 18 17 16	15 14 12 12 11		<u>                                     </u>			
	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7 I	6 5 4 3 2 1 0			
5. Channel Flow	Water reaches base of	Water fills >75% of the	Water fills 25-75% of the	Very little water in			
Status	both lower banks, and	available channel; or	available channel, and/or	channel and mostly			
	mimimal amount of	<25% of channel	riffle substrates are	present as standing pools.			
	channel substrate is	substrate is exposed.	mostly exposed.				
	exposed.						
Score 1							
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
6. Channel	Channelization or	Some channelization	Channelization may be	Banks shored with gabion			
Alteration	dredging absent or	present, usually in areas	extensive; embankments	or cement; over 80% of			
7 intoraction	minimal; stream	of bridge abutments;	or shoring structures	the stream reach			
	with normal	evidence of past	present on both banks;	channelized and disrupted.			
	pattern.	channelization, i.e.,	and 40 to 80% of stream	Instream habitat greatly			
	pattorn.	dredging, (greater than	reach channelized and	altered or removed			
		past 20 yr) may be	disrupted.	entirely.			
		present, but recent	aloruptou.	Onal Oly.			
		channelization is not					
Score 16		present.		<del>                                     </del>			
10	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0			
	20 10 17 10	10 14 10 14 11	10 3 0 1	0 0 7 0 2 1 0			

							1					1	
7. Channel		The bends in th	ne stream	The bend	ls in the str	eam	The bends in	n the stream		Channel strai	ght;		
Sinuosity		increase the str	ream	increase	the stream		increase the	stream		waterway has been channelized for a long			
		length 3 to 4 tin	nes longer	length 2 t	o 3 times l	onger	length 1 to 2	times longe	r	channelized f	or a long	)	
		than if it was in	a straight	than if it v	vas in a str	aight	than if it was	s in a straigh	t	distance.			
		line. (Note - cha	annel	line.			line.						
		braiding is cons	sidered										
		coastal plains a											
		normal low-lying											
		this parameter	•										
		easily rated in t											
		areas.)											
Score	 3			<del>'</del>	1 🗆 -		<del>'</del>				<del></del>		
00010		20 19 18	1 <u>L L</u> 3 17 1	6 15 1	1	<u> </u>	. 10 9	) 8 7	_	6 5 4	<u></u> 3	2 1	
		20 13 10	3 17 1	T 15 1	14 13	12 11	. 10 S	, ,	T	0 3 4			
8. Bank Stabil	ity	Banks stable; e	evidence	Moderate	ely stable;		Moderately	unstable; 30	-	Unstable; ma	ny erode	ed areas;	
(score each bar	ık)	of erosion or ba	ank failure	infrequen	t, small are	eas of	60% of bank	k in reach ha	s	"raw" areas fi	equently	along	
Note: determine lef	t or	absent or minin	nal; little	erosion m	nostly heale	ed	areas of ero	sion; high		straight section	ons and I	bends;	
right side by facing		potential for fut	ure	over. 5-30	0% of bank	in	erosion pote	ential during		obvious bank	sloughir	ng;	
downstream.		problems. <5%	of bank	reach has	s areas of		floods.	J		60-100% of b	ank has		
		affected.		erosion.						erosional sca	rs.		
Score (LB)	5	Г				П	<u> </u>		<del></del>	П	П		
,		Left Bank	10 9	8	7	6	5	4	3	2	1		
Score (RB)	5	Γ	$\overline{}$				<u> </u>		ī	П			
000.0 (1.12)		Right Bank 1	<u> </u>	<u> </u>		<u> </u>	<u></u>	<u> </u>	3		1		
		TIGITE BUTIK 1		т —			T	•	Ť				
9. Vegetative		More than 90%	of the	70-90% c	of the strea	m-	50-70% of the	ne stream-		Less than 50°	% of the		
Protection (sc	ore	streambank sui	rfaces and	-bank sur	faces cove	red	bank surface	es covered		streambank s	urfaces		
each bank)		immediate ripar	rian zones	by native	vegetation	, but	by vegetatio	n; disruption		covered by vegetation;			
Note: determine left	t or	covered by nati	ive	one class	of plants i	s not	obvious; pat	ches of bare	,	disruption of streambank			
right side by facing		vegetation, incl	uding	not well re	epresented	i	soil or close	ly cropped		vegetation is	very high	n;	
downstream.		trees, understo	ry shrubs,		n evident b		vegetation of	common; less	3	vegetation ha	s been		
		or nonwoody		-	full plant gi		than one-ha	If of the		removed to			
		macrophytes; v	egetative	_	to any grea		potential pla	nt stubble		5 centimeters	or less	in	
		disruption throu	-	ľ	ore than or		height rema			average stub			
		grazing or mow		· ·	e potential		l loight roma	ming.		average stab	ole fleigi		
		minimal or not	•		eight rema								
			•	Stubble II	eigni rema	iriirig.							
		almost all plant											
O (LD)	7	to grow naturall	iy.	<del>-</del>								_	
Score (LB)	/		<u> </u>		<u> </u>	Ц		<u> </u>			$\Box$		
Oner (DD)	_	Left Bank 2	10 9	8	7	6	5	4	3	2	1_	_	
Score (RB)	7	Dielet Deede 1	<u>, , , , , , , , , , , , , , , , , , , </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>_</u>	<u> </u>	$\Box$		
		Right Bank 1	.0 9	8	7	6	5 I	4	3	2	1		
10. Riparian		Width of riparia	n zone	Width of i	riparian zoı	ne 12-	Width of ripa	arian zone 6-		Width of ripar	ian zone	<6	
Vegstative Zo	ne	>18 meters; hu		18 meters			12 meters; h			meters: little			
Width (score e		activities (i.e., p			have impa	cted	<b>1</b>	ve impacted		vegetation du	•		
	u0		_							-	c to riun	ian	
bank riparian		lots, roadbeds,		Zone only	minimally	-	zone a grea	ı u <del>c</del> ai.		activities.			
zone)		cuts, lawns, or	• /										
	_	have not impac	ted zone.	<del></del>									
Score (LB)	8			✓		Ц					Ш		
		Left Bank 1	10 9	8	7	6	5	4	3	2	1		
Score (RB)	8			V									
		Right Bank 1	.0 9	8	7	6	5	4	3	2	1		
TOTAL SCORE	90												

Project ID:	Somerville	e South An	nendment	2	Str	eam	Class	:	Ephemeral				
Stream ID:	#27				Lo	catio	n:		Mackey, IN				
Lat:	38.23845	Long:	-87	.34994	Riv	er B	asin:		Ohio	ı			
Investigators:	Rajesh Po	udel											
Signature:			Da	ite:		5-May	/-2011			on for Sur			
Oigilatare.			Tiı	me:			2:5	1 PM	404 F	unctional	Asses	sment	
_		1			T					Ī			
WEATHER		Current			Past 2	_				Heavy raii		-	'S
CONDITIONS		l	eavy Rain)				avy Rair	۱)		□NO	✓ Yes		
		Rain Stea	-		Rair		•			Air Temp			18
			(Intermittent)	)	I —	-	ntermit	tent)		Air Temp	°F		65
		Cloud Cov			☑ Clou				90	Other:			
		✓ Clear/Sun	iny		Clea	ır/Sunr	ıy						
SITE LOCATION	ON/MAP	See Atta	chment										
STREAM		Stream Su	-							am Type			
CHARACTERI	ZATION	Perennial	Inter	mittent	<b>✓</b> Ep	hemer	al		_	ldwater			
									✓ W	armwater		_	
		Stream O	_	_						Catc Mile <sup>2</sup>	hment		0.4
		Upland R			Mixture	_				Mille Km²		_	.01
		Spring-fee	d/Ground wat	ter	Wetland	Ц	Other			KM		0	.0
WATERSHED		Surround	ing Land ı	use & F	Percen	tage		Loca	l Wat	ershed NP	S Pollu	ıntion	
FEATURES		✓ Forest	100	% 🔲 Со	mmercia	I		□No	eviden	ce 🔲 So	me poter	ntial sourc	es
		☐ Field/Past	ure	Otl	ner			<b>✓</b> Ob	vious s	ources Ag.	induc	ed sedi	ment
		Agricultur	e					Loca	l Wat	ershed Erc	sion		
		Residentia	al					☐ No	ne 🔽	' Moderate	Heav	/y	
RIPARIAN		Indicate ti	ne domina	nt tyn	a and i	radar	d the	domir	nant c	species pre	seant		
VEGETATION		Trees		Grasse		Herbs		None	iant	species pre	Joent		
(18 meter buff		Dominant			。    d d hard		_		orest				
,							-						
INSTREAM		Est. Reach				66	m	20		Canopy C			
FEATURES		Est. Strear			ft		m 2	0.0		Open		artly Oper	
		Sampling I			ft <sup>2</sup>	0	m <sup>2</sup>	0		✓ Shaded	∐P	artly Shac	ledC
		Sampling A			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0					
		Area in km			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water		ft	0.00
		Est. Water	•		in		m	0.0		High Water		m	0.00
		Surface Ve	elocity		ft/s	n/a	m/s	####	_	% of Stream			
				_					_	fle %	Ru		
		Channelize	_	☑ No					Po		Glid	de Pool	
		Dam Prese	ent Yes	✓ No	·				St∈	ep Pool Series			
LARGE WOOD	Υ	LWD0	0.0 m <sup>2</sup>		01	ft <sup>2</sup>							
		Density of	f I WD	m²/kı	m <sup>2</sup>	0.00	າດດດດດ	0000		ft <sup>2</sup> /mile <sup>2</sup>	n	იიიიი	იიიი

VEGETA		Indicate the dor ✓ Rooted Emerger	ninant type and re			ninant species pr Rooted Floating	esent □Non∈	ā	
		Free Floating	Attached Alg	•		Floating Algae	Пион	,	
		Portion of the re	each with aquatic		ion pr	esent		15 %	
WATER	QUALITY	Temperature	#### °C n/a	°F	Wat	er Odors			
		Conductivity	μs/cm		□N	ormal/None Se	wage	Petroleum	
		Total Dissolved	Solids	mg/l	С	hemical An	aerobic		
No V	Vater Prese	ent pH							
		Turbidity			Wat	er Surface Oils			
		☐ Clear ☐ S	light Turbid 🔲 Tur	bid		Slick Sheen	Globs	Flecks	
		Opague S	tained Oth	ier		Other			
SEDIME	NT/	Odors				Deposits			
SUBSTR	ATE	✓ Normal	Sewage P	etroleum		Sludge Saw	dust [	Paper fiber	Sand
		Chemical	Anaerobic N	lone		Relic Shells	Other		
		Other							
						Looking at stone		•	-
		Oils	_			embedded, are u			olor?
	0001110		Slight Moderate	: ∐P	rofuse	Yes		No	
IN Substrate		SUBSTRATE COMP		Cubat		SANIC SUBSTRA			lan in
Type	Diamet	-	e inSampling each	Subst Ty <sub>l</sub>		Characteris	tic	% Compositi Sampling Re	
Bedrock		i i i i	FACII	Detr		Sticks, wood, c	oarse	Sampling Ne	Eacii
Boulder	>10"			50	itao	plant materi			
Cobble	2.5 - 1			Mu	ck-	Black very fi			
Gravel	0.1 - 2.	5"		Мι	ud	organic matt	er		
Sand	gritty		5	Ma	arl	Grey, shel			
Silt	gooey	,	90			fragments			
Clay	slick		5						
Hal	oitat	H	ABITAT ASSESS	MENT	- LO\	W GRADINET ST	REAN	IS	
Para	meter	Optimal	SubOptima	al		Marginal		Poor	
1. Epifauı		Greater than 50%	30-50% for low		10-30%	6 for low	10% for	•	
Substrat		for low gradient streams)	gradient streams) mi	x of	_	nt streams) mix of	low grad	dient streams)	
Available	9	of substrate favorable for	stable habitat; well-s			habitat; habitat	stable h	abitat; lack of	
Cover		epifaunal colonization &	for full colonization			oility less than		is obvious;	
		fish cover; mix of snags,	potential; adequate h			ole; substrate		te unstable or	
		submerged logs, undercut	for maintenance of		·	ntly disturbed or	lacking.		
		banks, cobble or other stable habitat & at stage	populations; presence additional substrate i		remove	ea.			
		to allow full colonization	form of newfall, but n						
		potential (i.e., logs/snags	yet prepared for						
		that are not new fall and	colonization (may rat	e at					
		not transient).	high end of scale).				<u> </u>		
Score	1								
	•	<u> </u>							
		20 19 18 17 16	5 15 14 13	12 11	10	9 8 7	6 5	4 3 2	1 0

2. Pool	Mixture of substrate	Mixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no			
Substrate	materials, with gravel and	or clay; mud may be	bottom: little or no root	root mat or vegetation.			
Characterization	firm sand prevalent; root	dominant; some root mats	mat: no submerged	-			
	mats and submerged	and submerged	vegetation.				
	vegetation common.	vegetation present.					
Score 6				<u>'n n n n n n  </u>			
	20 19 18 17 16	15 14 13 12 11		6 5 4 3 2 1 0			
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small			
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.			
	small-deep pools present.	few shallow	pools.	onanon or poole aboom			
Score 1			<u> </u>				
	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0			
	10 10 10 17 10						
4.Sediment	Little or no enlargement	Some new increase in	Moderate deposition of	Heavy deposits of fine			
Deposition	of islands or point bars	bar formation, mostly	new gravel, sand or fine	material, increased bar			
	and less than <20% of	from gravel, sand or fine	sediment on old and new	development; more than			
	the bottom affected by	sediment; 20-50% of the	bars; 50-80% of the	80% of the bottom			
	sediment deposition.	bottom affected; slight	bottom affected; sediment	changing frequently; pools			
		deposition in pools.	deposits at obstructions,	almost absent due to			
			constrictions, and bends;	substantial sediment			
			moderate deposition of	deposition.			
			pools prevalent.				
Score 16		<u>'                                    </u>		'			
	20 19 18 17 16	15 14 13 12 11	. 10 9 8 7	6 5 4 3 2 1 0			
5. Channel Flow	Water reaches base of	Water fills >75% of the	Water fills 25-75% of the	Very little water in			
Status	both lower banks, and	available channel; or	available channel, and/or	channel and mostly			
Clatas	mimimal amount of	<25% of channel	riffle substrates are	,			
				present as standing pools.			
	channel substrate is	substrate is exposed.	mostly exposed.				
Score 1	exposed.	<del></del>	<del> </del>				
Score 1	20 19 18 17 16	15 14 13 12 11	<u> </u>				
	20 19 16 17 10	15 14 15 12 11	. 10 9 6 7 I	6 5 4 3 2 1 0			
6. Channel							
o. Onamici	Channelization or	Some channelization	Channelization may be	Banks shored with gabion			
Alteration	Channelization or dredging absent or	Some channelization present, usually in areas	Channelization may be extensive; embankments	Banks shored with gabion or cement; over 80% of			
			·	•			
	dredging absent or	present, usually in areas	extensive; embankments	or cement; over 80% of			
	dredging absent or minimal; stream	present, usually in areas of bridge abutments;	extensive; embankments or shoring structures	or cement; over 80% of the stream reach			
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e.,	extensive; embankments or shoring structures present on both banks;	or cement; over 80% of the stream reach channelized and disrupted.			
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed			
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly			
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed			
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed			
Alteration	dredging absent or minimal; stream with normal pattern.	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed			
	dredging absent or minimal; stream with normal	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed			

													1	
7. Channel		The bends in t	the strear	n	The bends	in the str	eam	The bends	in the stre	am	Channel stra	aight;		
Sinuosity		increase the s	tream		increase th	e stream		increase the	e stream		waterway has been r channelized for a long			
		length 3 to 4 ti	imes long	er	length 2 to	3 times le	onger	length 1 to	2 times lor	nger	channelized	for a lon	g	
		than if it was in	n a straig	ht	than if it wa	s in a str	aight	than if it wa	s in a stra	ight	distance.			
		line. (Note - ch	nannel		line.			line.						
		braiding is cor	nsidered											
		coastal plains		r										
		normal low-lyi												
		this parameter	•											
		easily rated in												
		areas.)												
Score 6	}	ПГ		$\overline{\Box}$				<del></del>		1 🔽				
00010	,	20 19 1	<u>.                                    </u>	<u>1</u>	15 14	13	<u> </u>	. 10	<u> </u>	<u></u> 7	6 5 4	<u></u>	2 1	
		20 19 1	10 17	10	13 14	13	12 11	. <u>10</u>	9 0		0 3 <del>4</del>	·	2 1	
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	stable;		Moderately	unstable;	30-	Unstable; ma	any erod	ed areas;	
(score each ban	ık)	of erosion or b	ank failui	re	infrequent,	small are	eas of	60% of ban	k in reach	has	"raw" areas	frequentl	y along	
Note: determine left	or	absent or mini	imal; little		erosion mo	stly heale	ed	areas of ero	osion; high	ı	straight sect	ions and	bends;	
right side by facing		potential for fu	ıture	over. 5-30%	6 of bank	in	erosion pot	_		obvious ban				
downstream.		problems. <5%			reach has a			floods.		5	60-100% of	J	٠ <i>,</i>	
· · · · · · · · · · · · · · ·		affected.			erosion.	•.					erosional sc			
Score (LB)	7		$\overline{\Box}$	$\overline{}$		<b>V</b>	$\neg$		$\overline{}$					
000:0 (22)		Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	7	LEIT Dalik	$\frac{10}{\Box}$	$\overline{\Box}$	$\stackrel{\circ}{\sqcap}$	<u>\</u>	$\overline{}$	$\overline{}$	$\overline{}$	$\vec{-}$		$\overline{}$	$\Box$	
Score (IVD)		Diaht Dank	<u> </u>	<u> </u>		7	<u> </u>	<u></u>	<u> </u>	<u> </u>	<u></u>	1	Ш	
		Right Bank	10	9	8		0		4	3	<u>Z</u>			
9. Vegetative		More than 90%	% of the		70-90% of	the strea	m-	50-70% of t	he stream	-	Less than 50	0% of the		
Protection (sco	ore	streambank si	urfaces a	nd	-bank surfa	ices cove	red	bank surfac	es covere	d	streambank	surfaces		
each bank)		immediate ripa	arian zon	es	by native ve	eaetation	. but	by vegetation	on: disrupt	ion	covered by v	/egetatio	n:	
Note: determine left	or	covered by na			one class of	•		obvious; pa	•		disruption of	-		
right side by facing	0.	vegetation, inc			not well rep	•		soil or close			vegetation is very high;			
downstream.		trees, underst	•	_	disruption e			vegetation			vegetation h		11,	
downstream.			ory Siliub	٥,	· ·			~		699	removed to	as been		
		or nonwoody		_	affecting fu			than one-ha		_				
		macrophytes;	-	е	potential to			potential pla		;	5 centimeter			
		disruption thro			extent; mor			height rema	aining.		average stul	oble heig	ht.	
		grazing or mo	•		half of the p									
		minimal or not	evident;		stubble hei	ght rema	ining.							
		almost all plar	nts allowe	d										
		to grow natura	ally.											
Score (LB)	6						<b>✓</b>							
		Left Bank	10	9	8	7	6	5	4	3	2	1		
Score (RB)	6						<b>✓</b>							
		Right Bank	10	9	8	7	6	5	4	3	2	1		
40 Diversion										_			_	
10. Riparian		Width of ripari			Width of rip		ne 12-	Width of rip		6-	Width of ripa			
Vegstative Zor		>18 meters; h	uman		18 meters;	human		12 meters;	human		meters: little	or no rip	arian	
Width (score ea	ach	activities (i.e.,	parking		activities ha	ave impa	cted	activities ha	ve impact	ed	vegetation d	ue to hur	man	
bank riparian		lots, roadbeds	, clear-		zone only r	ninimally		zone a grea	at deal.		activities.			
zone)		cuts, lawns, or	r crops)											
•		have not impa	cted zone	Э.										
Score (LB)	8			П	<u> </u>	$\overline{\Box}$		<del>'</del>	П					
()		Left Bank	10	<u> </u>	<u> </u>	_ <u></u>	6	 5	<u> </u>	<u> </u>		1		
Score (RB)	8	LCTC DUTIK	$\overline{\Box}$	Ť	<u> </u>	$\overrightarrow{\Box}$	$\overline{\Box}$	$\overline{\Box}$	<del>_</del>	$\overline{\Box}$		$\overline{}$	$\neg$	
(i.b)		Right Bank	<u> </u>	<u>၂</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u></u>	1		
TOTAL SCORE	90	o Dank				•			•					
IUIAL SUUKE	JU													

Project ID:	Somerville	South Ar	nendmer	nt 2	Str	ream	Class	<b>:</b> :	Ephemeral					
Stream ID:	#28				Lo	catio	n:		Mackey, IN					
Lat:	38.23719	Long:	-8	7.35017	Riv	ver B	asin:		Ohio					
Investigators:	Rajesh Po	udel												
Ciamatura.			С	ate:	;	5-May	/-2011		Reas	on for Sur	vey:			
Signature:			Т	ime:			2:3	31 PM	404 F	unctional	Asses	sment		
	•		•											
WEATHER		Current			Past 2	24-Ho	urs			Heavy rain	in las	t 7-day	/S	
CONDITIONS		Storm (H	eavy Rain)		Stor	rm (Hea	avy Rair	1)		□NO	✓ Yes	3		
		Rain Stea	ndy		Rair	n Stead	ly			Air Temp '	,C	1	18	
		Showers	(Intermitter	nt)	Sho	wers (I	Intermit	tent)		Air Temp	`F	(	65	
		Cloud Co	-	✓ Cloud Cover %						Other:				
		✓ Clear/Sur	nny		Clea	ar/Sunr	าง							
							,							
SITE LOCATION	ON/MAP	See Atta	chment											
STREAM		Stream S	uhsvsten	n					Stres	am Type				
CHARACTERI	<b>Ζ</b> ΔΤΙΩΝ	Perennial		ermittent	[√] Er	ohemer	·al			ldwater				
OHAIGAGTEIG	LATION			Similition	<u>-</u>	JIICITICI	ai							
		Stream O	rain						✓ Warmwater Catchment Area					
		Upland R	•	[7]	Mixture	of Orig	ılma			Mile <sup>2</sup>			.01	
		I ·			Wetland					Km <sup>2</sup>		_	).0	
		Spring-fe	a/Grouna w	ater	welland	<u>, П</u>	Other			13111			7.0	
WATERSHED		Surround	ing Land	l use & F	Percen	ıtage		Local	ocal Watershed NPS Polluntion					
FEATURES		✓ Forest	10	<b>0%</b> 🔲 Co	mmercia	ıl		□No	eviden	ce Soi	me potei	ntial sourc	ces	
		Field/Pas	ture	Oth	ner			✓ Obv	vious so	ources Ag.	induc	ed sedi	iment	
		Agricultu	re					Local	l Wat	ershed Ero	sion			
		Residenti	al					Nor	ne 🔽	' Moderate	☐ Hea\	/y		
RIPARIAN		Indicate t	ha damir	ant turn	a and	<b>"</b> ada"	d tha	domin	ant c	nacios nes	oont			
VEGETATION									iani s	species pre	sent			
		✓ Trees		Grasse	_	Herbs		None						
(18 meter buff	er)	Dominant	Species	: WIIXE	a naro	and	SOIT I	nast ic	orest					
INSTREAM		Est. Reacl	h Length		ft	192	m	59		Canopy Co	over			
FEATURES		Est. Strea	m Width		ft		m	0.0		Open	□Р	artly Ope	n	
		Sampling	Reach Ar	ea	ft <sup>2</sup>	0	$m^2$	0		✓ Shaded	□Р	artly Shad	dedC	
		Sampling .	Area mile	2	mile <sup>2</sup>	0.0	$km^2$	0.0				,		
		Area in km	$\eta^2$		mile <sup>2</sup>	0.0	$km^2$	0.0		High Water	Mark	ft	0.00	
		Est. Water	r Depth		in		m	0.0		High Water	Mark	m	0.00	
		Surface V	•		ft/s	n/a	m/s	####		% of Stream		ology		
			,						Rif	fle %	Rui			
		Channeliz	ed ∏ <sub>Yes</sub>	s 🔽 No						ol %		de Pool		
		Dam Pres	_							ep Pool Series				
						a. 2								
LARGE WOOD	Y	LWD_C	).0 m²		1	ft <sup>2</sup>								
DEBRIS				•	2					2 2				
I		Daneity o	f I WD	m²/kı	m <sup>2</sup>	0.00	າດດດດດ	იიიი		ft <sup>2</sup> /milo <sup>2</sup>	0	იიიიიი	0000	

VEGETA		Indicate the doi	minant type and re				esent None	ż	
		Free Floating	Attached Alg	•		Floating Algae	<b>—</b>	•	
		Portion of the re	each with aquatic	vegetat	ion pr	esent		0 %	
WATER	QUALITY	Temperature	#### °C _n/a	°F	Wat	er Odors			
		Conductivity	μs/cm		□ N	ormal/None Se	wage	Petroleum	
		Total Dissolved	Solids	mg/l	C	hemical An	aerobic		
No V	Vater Prese	ent pH							
		Turbidity			Wat	er Surface Oils			
		☐ Clear ☐ S	light Turbid 🔲 Tur	bid		Slick Sheen	Globs	Flecks	
		Opague S	tained Oth	ier		Other			
SEDIME	NT/	Odors				Deposits			
SUBSTR	ATE	✓ Normal	Sewage P	etroleum		Sludge ☐ Saw	dust [	Paper fiber Sa	and
		Chemical	Anaerobic N	lone		Relic Shells	Other		
		Other							
						Looking at stone			
		Oils				embedded, are u			or?
181	ODCANIC		Slight	P	rofuse	Yes		No	
Substrate	Diamet	SUBSTRATE COMP	te inSampling	Subst		GANIC SUBSTRA Characteris		% Composition	on in
Type	Diame	-	each	Typ		Characteris	ill	Sampling Re	
Bedrock			34011	Detri	-	Sticks, wood, co	oarse	Sumpling Re	uen
Boulder	>10"					plant materi			
Cobble	2.5 - 1	0"		Mud	ck-	Black very fi			
Gravel	0.1 - 2.	5"		Mu	ıd	organic matt	er		
Sand	gritty		15	Ма	arl	Grey, shel			
Silt	gooey	<u> </u>	70			fragments			
Clay	slick		15	<u> </u>					
Hab	oitat	Н	ABITAT ASSESS		- LOV	V GRADINET ST	REAN	IS	
	meter	Optimal	SubOptima	al	<u> </u>	Marginal		Poor	
1. Epifaui		Greater than 50%	30-50% for low		10-30%	% for low	10% for		
Substrat		for low gradient streams)	gradient streams) mi		_	nt streams) mix of	_	dient streams)	
Available	)	of substrate favorable for	stable habitat; well-s			habitat; habitat		abitat; lack of	
Cover		epifaunal colonization &	for full colonization			oility less than		is obvious;	
		fish cover; mix of snags, submerged logs, undercut	potential; adequate he for maintenance of			ole; substrate	lacking.	te unstable or	
		banks, cobble or other	populations; presend		remove		lacking.		
		stable habitat & at stage	additional substrate i		Cillove				
		to allow full colonization	form of newfall, but n						
		potential (i.e., logs/snags	yet prepared for						
		that are not new fall and	colonization (may rat	e at					
		not transient).	high end of scale).						
Score	1								
i									
		20 19 18 17 1	6 15 14 13	12 11	10	9 8 7	6 5	4 3 2	1 0

2. Pool	Mixture of substrate M	lixture of soft sand, mud	All mud or clay or sand	Hardpan clay of bedrock: no						
Substrate	materials, with gravel and or	r clay; mud may be	bottom: little or no root	root mat or vegetation.						
Characterization	firm sand prevalent; root do	ominant; some root mats	mat: no submerged							
	mats and submerged ar	nd submerged	vegetation.							
	vegetation common.	egetation present.								
Score 6										
•	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0						
3. Pool Variability	Even mix of largeshallow,	Majority of pools	Shallow pools much	Majority of pools small						
	large-deep, smallshallow,	large deep; very	more prevalent than deep	shallow or pools absent.						
	small-deep pools present. f	few shallow	pools.							
Score 1										
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0						
4.Sediment	Little or no enlargement So	Some new increase in	Moderate deposition of Heavy deposits of fine							
Deposition	of islands or point bars b	oar formation, mostly	new gravel, sand or fine	material, increased bar						
	and less than <20% of from	om gravel, sand or fine	sediment on old and new	development; more than						
	the bottom affected by	ediment; 20-50% of the	bars; 50-80% of the	80% of the bottom						
	sediment deposition.	ottom affected; slight	bottom affected; sediment	changing frequently; pools						
	de	eposition in pools.	deposits at obstructions,	almost absent due to						
			constrictions, and bends;	substantial sediment						
			moderate deposition of	deposition.						
			pools prevalent.							
Score 17										
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0						
5. Channel Flow	Water reaches base of W	Vater fills >75% of the	Water fills 25-75% of the	Very little water in						
Status			available channel, and/or	channel and mostly						
Status	·	•	riffle substrates are	present as standing pools.						
			mostly exposed.	present as standing pools.						
		ubstrate is exposed.	mostry exposed.							
Score 1	exposed.	<del> </del>								
	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0						
6. Channel	Channelization or So	Some channelization	Channelization may be	Banks shored with gabion						
Alteration	dredging absent or pr	resent, usually in areas	extensive; embankments	or cement; over 80% of						
	minimal; stream of	f bridge abutments;	or shoring structures	the stream reach						
		vidence of past	present on both banks;	channelized and disrupted.						
	pattern. ch	hannelization, i.e.,	and 40 to 80% of stream	Instream habitat greatly						
	ľ		reach channelized and	altered or removed						
	pa	altered or removed entirely.								
	ľ	resent, but recent	disrupted.	,						
	ľ	hannelization is not								
		resent.								
1 40	<del></del>	<del> </del>								
Score 18										
Score   18		15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0						

7 Channal		<b>-</b>			I <sub>=</sub> , , ,			I					1
7. Channel		The bends in t		n	The bends			The bends		am	Channel stra	•	
Sinuosity		increase the s	tream		increase th	ne stream		increase the			waterway ha		
		length 3 to 4 ti	imes long	er	length 2 to	3 times lo	onger	length 1 to	2 times lo	nger	channelized	for a long	g
		than if it was in	n a straigh	nt	than if it wa	as in a str	aight	than if it wa	s in a stra	ight	distance.		
		line. (Note - ch	nannel		line.			line.					
		braiding is cor	nsidered										
		coastal plains	and other	r									
		normal low-lyi	ng areas.										
		this parameter	r is not										
		easily rated in											
		areas.)											
Score 6	3		7 [	П		ПГ	7 [			7 🔽		пп	
	-	20 19 1	8 17	16	15 14	1 13	12 11	10	98	<u> </u>	6 5 4	<u> </u>	2 1
		20 15 1	.0 17			. 13		1			<u> </u>		
8. Bank Stabili	ity	Banks stable;	evidence		Moderately	/ stable;		Moderately	unstable;	30-	Unstable; ma	any erode	ed areas;
(score each ban	ık)	of erosion or b	oank failur	e	infrequent,	small are	eas of	60% of ban	k in reach	has	"raw" areas	frequently	y along
Note: determine left	or	absent or mini	imal; little		erosion mo	stly heal	ed	areas of ero	sion; high	1	straight sect	ions and	bends;
right side by facing		potential for fu	ıture		over. 5-30°	% of bank	in	erosion pot	ential duri	ng	obvious ban	k sloughi	ng;
downstream.		problems. <5%		reach has			floods.		•	60-100% of	J	J,	
		affected.			erosion.						erosional sc		
Score (LB)	7	directed.		$\overline{}$		<b>V</b>			$\overline{\Box}$				$\neg$
00010 (22)		Left Bank	10	9	8	<u> </u>	6	5	4	3	2	1	
Score (RB)	7	Leit bank		$\stackrel{\sim}{\vdash}$	$\overline{}$	<u></u>	$\overline{}$	$\overline{}$	$\overline{\Box}$	一		$\overline{}$	$\overline{}$
Score (ICD)		Diaba Dand	10	<u> </u>		<u> </u>	<u>Ц</u>	<u></u>	4	<u> </u>	<u></u>	<u> </u>	Ш
		Right Bank	10	9	8		О		4	3		1	
9. Vegetative		More than 90%	% of the		70-90% of	the strea	m-	50-70% of t	he stream	)-	Less than 50	0% of the	
Protection (sc	ore	streambank si	urfaces ar	nd	-bank surfa	aces cove	red	bank surfac	es covere	ed	streambank	surfaces	
each bank)		immediate ripa			by native v			by vegetation			covered by v		
Note: determine left	or	covered by na		,,	one class	•		obvious; pa	•			•	
	. OI										disruption of streambank vegetation is very high;		
right side by facing		vegetation, inc	•	_	not well re			soil or close			_		11,
downstream.		trees, underst	ory snrub	5,	disruption			vegetation		iess	vegetation h	as been	
		or nonwoody			affecting fu			than one-ha			removed to		
		macrophytes;	•	е	potential to			potential pla		Э	5 centimeter		
		disruption thro	ough		extent; mo	re than or	ne-	height rema	ining.		average stub	oble heigl	ht.
		grazing or mo	wing		half of the	potential	plant						
		minimal or not	evident;		stubble he	ight rema	ining.						
		almost all plar	nts allowe	d									
		to grow natura	ally.										
Score (LB)	7					V							
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	7					V							
		Right Bank	10	9	8	7	6	5	4	3	2	1	
10. Riparian		Width of ripari	an zone		Width of rip	oarian zoi	ne 12-	Width of rip	arian zon	e 6-	Width of ripa	rian zone	e <6
Vegstative Zor	ne	>18 meters; h	uman		18 meters;	human		12 meters;	human		meters: little	or no rip	arian
Width (score ea	ach	activities (i.e.,	parking		activities h	ave impa	cted	activities ha	ve impac	ted	vegetation d	ue to hur	man
bank riparian		lots, roadbeds	-		zone only	minimally		zone a grea	t deal		activities.		
-							-	a groc					
zone)		cuts, lawns, or	. ,										
		have not impa	cted zone	). —			_		_				
Score (LB)	8		Ш	Ш	✓	Ш	Ш	Ш	Ш		Ш		Ш
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	8				$\checkmark$								
		Right Bank	10	9	8	7	6	5	4	3	2	1	
TOTAL SCORE	94						•						

Project ID:	Somerville	e South An	nendmen	t 2	Str	eam	Class	:	Ephemeral				
Stream ID:	#29				Lo	catio	n:		Mackey, IN				
Lat:	38.23688	Long:	-8	7.3503	Riv	er B	asin:		Ohio	1			
Investigators:	Rajesh Po	udel											
Signature:			Da	ate:		5-May	/-2011			on for Sur			
Oigilatare.			Ti	me:			2:3	34 PM	404 F	unctional	Asses	sment	
_		1								Ī			
WEATHER		Current			Past 2	24-Ho	urs			Heavy rain		-	'S
CONDITIONS		l	eavy Rain)				avy Rair	۱)		□NO	✓ Yes		
		Rain Stea	-		Rair		-			Air Temp			18
		Showers (	-	)			ntermit	tent)		Air Temp	°F	•	<u> </u>
		Cloud Cov			Clou				90	Other:			
		✓ Clear/Sun	iny		Clea	ır/Sunr	ıy						
SITE LOCATION	ON/MAP	See Atta	chment		<u> </u>								
			_							_			
STREAM		Stream Su								am Type			
CHARACTERI	ZATION	Perennial	☐ Inter	mittent	<b>∠</b> Ep	hemer	al		_	ldwater			
									✓ W	armwater		_	
		Stream Or	_	_							hment		0.4
		Upland R			Mixture	_				Mile <sup>2</sup>		_	.01
		Spring-fee	d/Ground wa	ter	Wetland		Other			Km <sup>2</sup>		0	.0
WATERSHED		Surroundi	ing Land	use & I	Percen	tage		Loca	l Wat	ershed NP	S Pollu	untion	
FEATURES		✓ Forest	90	<b>%</b> □ Co	mmercia	ı		□No	eviden	ce 🔲 So	me potei	ntial sourc	es
		☐ Field/Past	ure	Ot	her			<b>✓</b> Ob	vious s	ources Ag.	induc	ed sedi	ment
		✓ Agricultur	e <b>10</b> 9	%				Loca	l Wat	ershed Erc	sion		
		Residentia	al				_	☐ No	ne 🔽	' Moderate	Heav	/y	
RIPARIAN		Indicate th	aa damin	ant turn	o ond i	d	d tha	domir	oont c	nacios ne	oont.		
VEGETATION		Trees		Grasse		Herbs		None	iants	species pre	esent		
(18 meter buff		Dominant			_		_		orast				
(10 meter bun	ei <i>j</i>		-					iiast it	orest				
INSTREAM		Est. Reach				193	m	59		Canopy C	over		
FEATURES		Est. Strear			ft		m	0.0		Open		artly Opei	
		Sampling I			ft <sup>2</sup>	0	m <sup>2</sup>	0		Shaded	✓P	artly Shac	ledC
		Sampling A		1	mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0					
		Area in km	الأ		mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water	Mark	ft	0.00
		Est. Water	Depth		in		m	0.0		High Water	Mark	m	0.00
		Surface Ve	elocity		ft/s	n/a	m/s	####		% of Stream	n Morph	ology	
									Rif	fle %	Rui	n %	
		Channelize	_	✓ No	)				Po	ol %	Glid	de Pool	
		Dam Prese	ent <sub>Yes</sub>	✓ No	)				Ste	ep Pool Series			
LARGE WOOD	Y	LWD 0	.0 m²		01	ft²							
		Density of	f I WD	m²/k	m²	0.00	00000	0000		ft <sup>2</sup> /mile <sup>2</sup>	0	იიიიი	0000

AQUATIO			Indicate the dom	ninant type and re	cord th	e don	ninant species pro	esent	
VEGETA	TION		✓ Rooted Emergent		•		_	☐ None	е
			☐ Free Floating	Attached Alga	ae		Floating Algae		
			Portion of the re-	ach with aquatic	vegetat	ion pr	resent		5 %
WATED (	OLIALITY		Tomoroustino	#### °C - ~/o	۰۶	10/04	ton Odono		
WATER	QUALIT		Temperature	#### °C	°F		ter Odors		
			Conductivity Total Dissolved	μs/cm Solids	ma/l	_	Iormal/None Sev	•	Petroleum
No V	Vater Pres	ont	pH pissolved	Solius	mg/l	Цυ	hemical An	aerobic	
140 1	Valei Fies	3111							
			Turbidity			Wat	ter Surface Oils		
				ight Turbid 🔲 Tur	bid			Globs	Flecks
			Opague Sta	ained Oth	er		Other		
SEDIMEN	NT/		Odors				Deposits		
SUBSTR	ATE		✓ Normal	Sewage P	etroleum		Sludge Sawd	dust [	Paper fiber Sand
			Chemical	Anaerobic N	lone		Relic Shells	Other	
			Other						
			_				Looking at stone	s whic	h are not deeply
			Oils				embedded, are u	unders	ides black in color?
			Absent SI	light Moderate	Р	rofuse	Yes		□No
IN	ORGANIC	SUBS	STRATE COMPO	DNENTS		ORC	SANIC SUBSTRA	ATE C	OMPONENTS
Substrate	Diame	ter	· ·	e inSampling	Subst	rate	Characteris	tic	% Composition in
Type		ŀ	Re	ach	Тур	20			Sampling Reach
									Sampling Reach
Bedrock				2	Detr		Sticks, wood, co		Jumping Reden
Bedrock Boulder	>10"				Detr	itus	plant materi	al	Sumpling Reach
Bedrock Boulder Cobble	2.5 - 1	0"	:	2	Detri	itus ck-	plant materi Black very fir	al ne	Sumpling Reden
Bedrock Boulder Cobble Gravel	2.5 - 1 0.1 - 2.	0" .5"	5	53	Detri Mud Mu	itus ck- ud	plant materi Black very fir organic matt	al ne er	Sumpling Reden
Bedrock Boulder Cobble Gravel Sand	2.5 - 1 0.1 - 2. gritty	0" .5"	5	2 53 10	Detri	itus ck- ud	plant materi Black very fir organic matt Grey, shell	al ne er	Jumphing Reden
Bedrock Boulder Cobble Gravel Sand Silt	2.5 - 1 0.1 - 2. gritty gooe	0" .5" ,	5 1	53 10 30	Detri Mud Mu	itus ck- ud	plant materi Black very fir organic matt	al ne er	Jumphing Reden
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe slick	0" .5" ,	5 1 3	53 10 30 5	Mud Mu Mu Ma	itus ck- ud arl	plant materi Black very fir organic matt Grey, shell fragments	al ne er	
Bedrock Boulder Cobble Gravel Sand Silt Clay	2.5 - 1 0.1 - 2. gritty gooe slick	0" .5" ,	5 1 3 9	2 53 10 30 5 <b>ABITAT ASSESS</b>	Mud Mu Ma	itus ck- ud arl	plant materia Black very fir organic matt Grey, shell fragments	al ne er	18
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hab	2.5 - 1 0.1 - 2. gritty gooe slick  citat meter	0" .5" y	5 1 3 HA	2 53 10 30 5 ABITAT ASSESS SubOptima	Mud Mud Ma Ma	itus ck- ud arl	plant materi Black very fir organic matt Grey, shell fragments W GRADINET ST Marginal	al ne er	is Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hat Parar  1. Epifaur	2.5 - 1 0.1 - 2. gritty gooe slick  bitat meter nal	0" .5" y	55 1 3 HA Optimal er than 50%	2 53 10 30 5 ABITAT ASSESS SubOptima 30-50% for low	Mud Mu Ma Ma SMENT	itus  ck-  id  arl  - LO\	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal	al ne er REAN	1S Poor
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hab Parar 1. Epifaur Substrate	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	0" 5" y  Greate for low	The streams of the stream of	53 10 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix	Mud Mu Ma Ma MENT al	ck- ud arl - LO\ 10-309 gradiel	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low and streams mix of	REAN	Poor r dient streams)
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O" 5" y  Greate for low of subs	HA Optimal er than 50% gradient streams) strate favorable for	53 10 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mitstable habitat; well-su	Mud Mu Ma Ma SMENT al	ck- ud arl  10-30% gradier stable	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal % for low nt streams) mix of habitat; habitat	REAN 10% for low grastable h	Poor dient streams) habitat; lack of
Bedrock Boulder Cobble Gravel Sand Silt Clay  Hab Parar 1. Epifaur Substrate	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O" 5" y  Greate for low of subs epifaur	Optimal er than 50% gradient streams) strate favorable for than colonization &	2 53 10 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) minustable habitat; well-streams for full colonization	Mud Mud Ma	ck- ud arl  10-309 gradier stable availate	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low nt streams) mix of habitat; habitat bility less than	REAM 10% for low grastable habitat	Poor  dient streams) habitat; lack of is obvious;
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish co	Optimal er than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags,	2 53 10 30 5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mi: stable habitat; well-streams for full colonization potential; adequate h	Mud Mud Mud Ma	ck- ud arl  10-309 gradiel stable availab desiral	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal % for low nt streams) mix of habitat; habitat bile; substrate	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish cor subme	Optimal  The than 50%  The gradient streams)  Strate favorable for than colonization & the colonization were; mix of snags, the gradient streams and colonization were the colonization with the colonization were the colonization with the colon	2 53 10 30 5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of	Muc Muc Muc Ma	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	REAM 10% for low grastable habitat	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subsepifaur fish cor subme banks,	Optimal  The trans 50%  The gradient streams)  Strate favorable for that colonization & the colonization & the colonization wer; mix of snags, the gradient streams of snags, the gradient	2 53 10 30 5 ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence	Mud Mud Mud Mud Mad Mud Mad Mud Mad Mud Mud Mud Mud Mud Mud Mud Mud Mud Mu	ck- ud arl  10-309 gradiel stable availab desiral	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish cor subme banks, stable	Optimal  The transon of	2  53  10  30  5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mix stable habitat; well-so for full colonization potential; adequate h for maintenance of populations; presence additional substrate i	Muc Muc Muc Muc Ma	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish cor subme banks, stable to allov	Optimal  The than 50%  The gradient streams)  Strate favorable for that colonization & ver; mix of snags, arged logs, undercut cobble or other thabitat & at stage we full colonization	2  53 10 30 5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n	Muc Muc Muc Muc Ma	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish cor subme banks, stable to allov potenti	Detimal  The company of the company	2  53  10  30  5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for	Mud	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish co subme banks, stable to allov potenti that are	Optimal  The than 50%  The gradient streams)  Strate favorable for than colonization & the ver; mix of snags, the gradient strate favorable or other thabitat & at stage w full colonization that (i.e., logs/snags the not new fall and	2  53  10  30  5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mit stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for colonization (may rat	Mud	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or
Bedrock Boulder Cobble Gravel Sand Silt Clay Hate Parar 1. Epifaur Substrate Available	2.5 - 1 0.1 - 2. gritty gooe slick bitat meter nal	O"  5"  Y  Greate for low of subs epifaur fish co subme banks, stable to allov potenti that are	Detimal  The company of the company	2  53  10  30  5  ABITAT ASSESS SubOptima 30-50% for low gradient streams) mis stable habitat; well-st for full colonization potential; adequate h for maintenance of populations; presence additional substrate i form of newfall, but n yet prepared for	Mud	ck- ud arl  10-30% gradiel stable availab desiral freque	plant materia Black very fir organic matt Grey, shell fragments  W GRADINET ST Marginal for low Int streams) mix of habitat; habitat bility less than ble; substrate Intly disturbed or	REAN 10% for low grastable habitat substra	Poor dient streams) habitat; lack of is obvious; te unstable or

2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: no
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged
	mats and submerged and submerged vegetation.
	vegetation common. vegetation present.
Score 7	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small
	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.
	small-deep pools present. few shallow pools.
Score 2	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4.Sediment	Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine
Deposition	of islands or point bars bar formation, mostly new gravel, sand or fine material, increased bar
	and less than <20% of from gravel, sand or fine sediment on old and new development; more than
	the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom
	sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools
	deposition in pools. deposits at obstructions, almost absent due to
	constrictions, and bends; substantial sediment
	moderate deposition of deposition.
	pools prevalent.
Score 16	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
E Channel Flaw	W
5. Channel Flow	Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in
Status	both lower banks, and available channel; or available channel, and/or channel and mostly
	mimimal amount of <25% of channel riffle substrates are present as standing pools.
	channel substrate is substrate is exposed. mostly exposed.
	exposed.
Score 1	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6. Channel	Channelization or Some channelization Channelization may be Banks shored with gabion
Alteration	dredging absent or present, usually in areas extensive; embankments or cement; over 80% of
	minimal; stream of bridge abutments; or shoring structures the stream reach
	with normal evidence of past present on both banks; channelized and disrupted.
	pattern. channelization, i.e., and 40 to 80% of stream Instream habitat greatly
	dredging, (greater than reach channelized and altered or removed
	past 20 yr) may be disrupted. entirely.
	present, but recent
	channelization is not
Score 18	
10 10	
	20

								1					1
7. Channel		The bends in t	the strear	n	The bends	in the str	eam	The bends	in the stre	am	Channel stra	aight;	
Sinuosity		increase the s	tream		increase th	ne stream		increase the	e stream		waterway ha	is been	
		length 3 to 4 ti	imes long	er	length 2 to	3 times l	onger	length 1 to	2 times lor	nger	channelized	for a long	g
		than if it was in	n a straig	ht	than if it wa	as in a str	aight	than if it wa	s in a stra	ight	distance.		
		line. (Note - ch	nannel		line.			line.					
		braiding is cor	nsidered										
		coastal plains		r									
		normal low-lyi											
		this parameter	•										
		easily rated in											
		areas.)											
Score 6	3	ПГ		$\overline{\Box}$				<del>'                                    </del>		1 🔽			
00010	_	20 19 1	<u>.                                    </u>	<u>1</u>	15 1 <sup>4</sup>	1 13	<u> </u>	 10	<u> </u>	<u></u> 7	6 5 4	<u></u>	2 1
		20 15 1	.0 17	10	13 1-	<del>, 1</del> 5	12 11	. <u>10</u>	5 0				2 1
8. Bank Stabil	ity	Banks stable;	evidence	!	Moderately	/ stable;		Moderately	unstable;	30-	Unstable; ma	any erod	ed areas;
(score each bar	ık)	of erosion or b	ank failu	re	infrequent,	small are	eas of	60% of ban	k in reach	has	"raw" areas	frequentl	y along
Note: determine left	or	absent or mini	imal; little		erosion mo	stly heal	ed	areas of ero	osion; high	ı	straight sect	ions and	bends;
right side by facing		potential for fu	iture		over. 5-309	% of bank	c in	erosion pot	ential durii	ng	obvious ban	k sloughi	ng;
downstream.		problems. <5%	% of bank		reach has	areas of		floods.		-	60-100% of	bank has	•
		affected.			erosion.						erosional sc	ars.	
Score (LB)	7			П		$\overline{\checkmark}$			П	П		П	
,		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	7			$\overline{\Box}$		<b>V</b>	$\overline{\Box}$		П	П			
000.0 (1.12)	•	Right Bank	10	9	8	7	<u> </u>	 5	4	3		1	
		Mg//C Bu//K						T	•				
9. Vegetative		More than 90%	% of the		70-90% of	the strea	m-	50-70% of t	he stream	-	Less than 50	0% of the	
Protection (sc	ore	streambank si	urfaces a	nd	-bank surfa	aces cove	ered	bank surfac	es covere	d	streambank	surfaces	
each bank)		immediate ripa	arian zon	es	by native v	egetation	ı, but	by vegetation	on; disrupt	ion	covered by v	egetatio	n;
Note: determine left	or	covered by na	ıtive		one class o	of plants i	s not	obvious; pa	tches of b	are	disruption of streambank		
right side by facing		vegetation, inc	cluding		not well rep	presented	t	soil or close	ely croppe	d	vegetation is very high;		
downstream.		trees, underst	ory shrub	s,	disruption (			vegetation	common; I	ess	vegetation h	as been	
		or nonwoody	•		affecting fu			than one-ha	alf of the		removed to		
		macrophytes;	vegetativ	e	potential to			potential pla	ant stubble	)	5 centimeter	s or less	in
		disruption thro	-	-	extent; mo			height rema			average stul		
		grazing or mo			half of the			Inoight forme	an in ig.		average stat	obic ricig	
		minimal or not	•		stubble hei		•						
			-		Stubble Hei	igni rema	iriirig.						
		almost all plar		a									
O (LD)	7	to grow natura	illy.	_				<del></del>					
Score (LB)	1	. (. p	<u> </u>	$\overline{\Box}$	<u> </u>	$\overline{\square}$	Ц		Ц	ᆫ		$\perp$	
Onere (DD)	_	Left Bank	10	9	8	7	6	5	4	3	2	1_	_
Score (RB)	7	Dialet David	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>		
		Right Bank	10	9	0		6	<u> </u>	4	3	2	1	
10. Riparian		Width of ripari	an zone		Width of rip	oarian zoi	ne 12-	Width of rip	arian zone	e 6-	Width of ripa	rian zone	e <6
Vegstative Zo	ne	>18 meters; h			18 meters;	human		12 meters:	human		meters: little	or no rip	arian
Width (score e		activities (i.e.,			activities h		cted	activities ha	ve impact	ed	vegetation d	ue to hur	man
bank riparian		lots, roadbeds	-							ou	activities.	40 10 1141	nan
-		•			zone only r	ıııııııalıy	•	zone a grea	ucai.		activities.		
zone)		cuts, lawns, or	. ,										
0	_	have not impa	cted zone	e.				<u> </u>		_			
Score (LB)	7		<u> </u>	<u>Ц</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	Ш	<u> </u>	<u>Ц</u> _	
		Left Bank	10	9	8	7	6	5	4	3	2	1_	
Score (RB)	8				V								
		Right Bank	10	9	8	7	6	5	4	3	2	1	
TOTAL SCORE	94												

Project ID:	Somerville South Amendment 2						Stream Class:				Ephemeral			
Stream ID:	#30					Location:			Mackey, IN					
Lat:	38.23608	-87.3	35117	River Basin:				Ohio						
Investigators:	Rajesh Po	udel												
Cianatura		Dat	te:		5-May-2011			Reas	on for Sur	vey:				
Signature:		Tim	ne:			2:1	11 PM	404 F	unctional	Asses	sment			
WEATHER		Current		Past 24-Hours					Heavy rain in last 7-days					
CONDITIONS		Storm		Storm (Heavy Rain)					□ NO ✓ Yes					
		Rain Steady				Rai	n Stead	ly			Air Temp	°C		18
	☐ Showers (Intermittent)				☐ Showers (Intermittent)					Air Temp	°F		65	
		Cloud Cover %				<b>✓</b> Clo	ud Cove	er %		90	Other:			
	✓ Clear/Sunny				Clear/Sunny									
OITE LOCATIO		0 44	4											
SITE LOCATION	JN/WAP	See At	tacnm	ent										
STREAM		Stream	Subsy	stem						Strea	am Type			
CHARACTER	IZATION	Perenr					Coldwater							
							✓ Warmwater							
		Stream	Orgin							Catchment Area				
Upland Runoff					✓ Mixture of Origins					Mile <sup>2</sup> 0.01				.01
	Spring-fed/Ground water Wetland Other									Km <sup>2</sup>		C	0.0	
WATERCHER		C	ا بمائیم	a.a.d	0 [	3	-4		1	1 \A/-4	arabad ND	C Dall		
WATERSHED	Surrounding Land use & Percentage  ✓ Forest  40% ☐ Commercial							Local Watershed NPS Polluntion						
FEATURES		Forest					evidence Some potential sources							
		Field/P		CO0/						bvious sources Ag. induced sediment al Watershed Erosion				
✓ Agriculture					·——			_				_		
		Reside	ntial						☐ No	ne <u>L</u> ✓	Moderate	Heav	/y	
RIPARIAN		Indicate	the d	omina	nt typ	e and	redor	d the	domii	nant s	species pre	esent		
VEGETATION		✓ Trees	Shr	ubs [	Grasse	es 🗀	Herbs		None					
(18 meter buff	fer)	Domina	nt Spe	cies:	Mixe	d hard	d and	soft n	nast f	orest,	ag field			
INSTREAM		Est Bos	ob Lor	ath		f+	222	m	60		Canopy C	OV0#		
						ft	222		0.0				andle On a	_
FEATURES	Est. Stream Wid Sampling Reach					ft <sup>2</sup>	0	m m²	0.0		Open		artly Ope	
		Samplin	_			mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		Shaded	<b>V</b> P	artly Shad	aeac
		Area in I	_	TITLE		mile <sup>2</sup>	0.0	km <sup>2</sup>	0.0		High Water	Mork	ft	0.00
						in	1.0	m	0.0		High Water		m	0.00
Est. Water Depth Surface Velocity						ft/s	0.1	m/s	0.0		% of Stream			0.00
		Surface	v <del>C</del> IUUI	ıy		11/3	0.1	111/5	0.0			•	•	
		Channe	ואסקן	Yes	✓ No				Riffle % Run %					
		Dam Pre	_	_	✓ No	_				Pool % Glide Pool  Step Pool Series				
		Daill F R	JOHN	Yes	Ŭ INO					S[€	ep Poor Series			
LARGE WOOD DEBRIS	Υ	LWD	0.3	m²	;	3	ft <sup>2</sup>							
		Density	of LW	/D	m²/kı	m²	0.00	00002	2787		ft <sup>2</sup> /mile <sup>2</sup>	0.	000000	1076

AQUATION	С		Indicate the dom	ninant type and re	cord th	e don	ninant species pro	esent		
VEGETA	TION		Rooted Emergent		•		_	<b>✓</b> None	Ż	
			☐ Free Floating	Attached Alga	ae		Floating Algae			
			Portion of the re	ach with aquatic v	vegetat	ion pr	esent		0 %	
WATER QUALITY			Temperature Conductivity Total Dissolved pH 6.1	#### °C n/a µs/cm Solids 155	56.4 <b>217</b> mg/l	✓N	er Odors ormal/None Sev hemical An	wage aerobic	Petroleum	
				ight Turbid Turl			er Surface Oils Slick ☐ Sheen ☐ Other	Globs	Flecks	
SEDIMENT/ SUBSTRATE				Anaerobic N		rofuse	Looking at stone	Other	- ' -	
IN	IORGANIC	SUBS	STRATE COMPO	ATE C	TE COMPONENTS					
Substrate	Diame	er	% Composite	e inSampling	Substrate		Characteristic		% Composition in	
Type			Re	ach	Туј	Эе			Sampling Reach	
Bedrock					Detr	itus	Sticks, wood, coarse			
Boulder	>10"						plant materi			
Cobble	2.5 - 1			50	Mu		Black very fir			
Gravel Sand	0.1 - 2. gritty			20	Mud Marl		organic matt Grey, shell			
Silt	gooe			20	IVIAII		fragments			
Clay	slick			10			nagments			
				ABITAT ASSESS	MENIT	1.0	ALCDADINET CT	DEAN	10	
	bitat meter		Optimal	ADITAT ASSESS	INITIALI	- LU		Poor		
1. Epifau				SubOntime	al le		Marginal		PAAR	
paa	nal	Greate		SubOptima 30-50% for low	al	10-309	Marginal 6 for low	10% for		
Substrat			er than 50%	30-50% for low			% for low	10% for		
Substrat Available	:e/	for low	er than 50% gradient streams)	30-50% for low gradient streams) mix	x of	gradie	% for low nt streams) mix of	low grad	dient streams)	
Substrat Available Cover	:e/	for low of subs	er than 50% gradient streams) strate favorable for	30-50% for low	x of uited	gradie stable	6 for low  th streams) mix of  habitat; habitat	low grad	dient streams) abitat; lack of	
Available	:e/	for low of subs epifaur	er than 50% gradient streams)	30-50% for low gradient streams) mix stable habitat; well-su	x of uited	gradie stable availat	% for low nt streams) mix of	low grad stable h habitat i	dient streams)	
Available	:e/	for low of subs epifaur fish co	er than 50% gradient streams) strate favorable for hal colonization &	30-50% for low gradient streams) mix stable habitat; well-su for full colonization	x of uited abitat	gradiei stable availat desiral	6 for low  Int streams) mix of  habitat; habitat  Sility less than	low grad stable h habitat i	dient streams) habitat; lack of his obvious;	
Available	:e/	for low of subs epifaur fish co subme	er than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags,	30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h	x of uited abitat	gradiei stable availat desiral	of for low  In the streams of the streams of the streams of the streams of the stream	low grad stable h habitat i substrat	dient streams) habitat; lack of his obvious;	
Available	:e/	for low of subs epifaur fish co subme banks,	er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, rrged logs, undercut	30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of	x of uited abitat e of	gradien stable availat desiral freque	of for low  In the streams of the streams of the streams of the streams of the stream	low grad stable h habitat i substrat	dient streams) habitat; lack of his obvious;	
Available	:e/	for low of subs epifaur fish co subme banks, stable	er than 50% gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other	30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence	x of uited abitat e of	gradien stable availat desiral freque	of for low  In the streams of the streams of the streams of the streams of the stream	low grad stable h habitat i substrat	dient streams) habitat; lack of his obvious;	
Available	:e/	for low of subsepifaur fish co- subme banks, stable to allow	gradient streams) strate favorable for nal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage	30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence additional substrate in	x of uited abitat e of	gradien stable availat desiral freque	of for low  In the streams of the streams of the streams of the streams of the stream	low grad stable h habitat i substrat	dient streams) habitat; lack of his obvious;	
Available	:e/	for low of subs epifaur fish co subme banks, stable to allow potenti	er than 50% gradient streams) strate favorable for nal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage w full colonization	30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence additional substrate in form of newfall, but no	x of uited abitat e of n	gradien stable availat desiral freque	of for low  In the streams of the streams of the streams of the streams of the stream	low grad stable h habitat i substrat	dient streams) habitat; lack of his obvious;	
Available	:e/	for low of subsepifaur fish consubme banks, stable to allow potentithat are	gradient streams) strate favorable for hal colonization & ver; mix of snags, rged logs, undercut cobble or other habitat & at stage w full colonization hal (i.e., logs/snags	30-50% for low gradient streams) mix stable habitat; well-su for full colonization potential; adequate h for maintenance of populations; presence additional substrate in form of newfall, but no yet prepared for	x of uited abitat e of n	gradien stable availat desiral freque	of for low  In the streams of the streams of the streams of the streams of the stream	low grad stable h habitat i substrat	dient streams) habitat; lack of his obvious;	

	<del>-</del>
2. Pool	Mixture of substrate Mixture of soft sand, mud All mud or clay or sand Hardpan clay of bedrock: no
Substrate	materials, with gravel and or clay; mud may be bottom: little or no root root mat or vegetation.
Characterization	firm sand prevalent; root dominant; some root mats mat: no submerged
	mats and submerged vegetation.
	vegetation common. vegetation present.
Score 7	
•	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3. Pool Variability	Even mix of largeshallow, Majority of pools Shallow pools much Majority of pools small
	large-deep, smallshallow, large deep; very more prevalent than deep shallow or pools absent.
	small-deep pools present.   few shallow   pools.
Score 2	<u> </u>
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
4.Sediment	Little or no enlargement Some new increase in Moderate deposition of Heavy deposits of fine
Deposition	of islands or point bars bar formation, mostly new gravel, sand or fine material, increased bar
	and less than <20% of from gravel, sand or fine sediment on old and new development; more than
	the bottom affected by sediment; 20-50% of the bars; 50-80% of the 80% of the bottom
	sediment deposition. bottom affected; slight bottom affected; sediment changing frequently; pools
	deposition in pools. deposits at obstructions, almost absent due to
	constrictions, and bends; substantial sediment
	moderate deposition of deposition.
	pools prevalent.
Score 14	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
5. Channel Flow	Matarasa Landa Matarasa Anna M
	Water reaches base of Water fills >75% of the Water fills 25-75% of the Very little water in
Status	both lower banks, and available channel; or available channel, and/or channel and mostly
	mimimal amount of <pre> &lt;25% of channel</pre>
	channel substrate is substrate is exposed. mostly exposed.
0	exposed.
Score 7	
	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
6. Channel	Channelization or Some channelization Channelization may be Banks shored with gabion
Alteration	dredging absent or present, usually in areas extensive; embankments or cement; over 80% of
	minimal; stream of bridge abutments; or shoring structures the stream reach
	with normal evidence of past present on both banks; channelized and disrupted.
	pattern. channelization, i.e., and 40 to 80% of stream Instream habitat greatly
	dredging, (greater than reach channelized and altered or removed
	past 20 yr) may be disrupted. entirely.
	present, but recent
	channelization is not
	present.
Score 18	
1 .3	20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
	120 13 10 17 10 13 17 12 11 10 3 0 7 0 3 7 3 2 1 0

													1
7. Channel		The bends in t	the strear	n	The bends	in the str	eam	The bends	in the stre	am	Channel stra	aight;	
Sinuosity		increase the s	tream		increase th	e stream		increase the	e stream		waterway ha	is been	
		length 3 to 4 ti	imes long	er	length 2 to	3 times l	onger	length 1 to	2 times lor	nger	channelized	for a long	g
		than if it was in	n a straig	ht	than if it wa	as in a str	aight	than if it wa	s in a strai	ght	distance.		
		line. (Note - ch	nannel		line.			line.					
		braiding is cor	nsidered										
		coastal plains		r									
		normal low-lyi											
		this parameter is not											
	easily rated in these												
	areas.)												
Score 6				пп		7 [		ПГ	1 🔽				
	20 19 1	8 17	16	15 14	13	12 11	. 10	98	<u>7</u>	6 5 4	<u> </u>	2 1	
		20 13 1	.0 17		15 1	13		T =0					
8. Bank Stabili	ity	Banks stable; evidence			Moderately stable;			Moderately	unstable;	30-	Unstable; many eroded areas;		
(score each ban	ık)	of erosion or b	ank failu	re	infrequent, small areas of			60% of ban	k in reach	has	"raw" areas frequently along		
Note: determine left	or	absent or mini	imal; little		erosion mo	stly heal	ed	areas of ero	sion; high		straight sections and bends;		
right side by facing		potential for fu	ıture		over. 5-30%	% of bank	c in	erosion pot	ential durir	ng	obvious bank sloughing;		
downstream.		problems. <5% of bank			reach has areas of			floods.			60-100% of bank has		
		affected.			erosion.						erosional scars.		
Score (LB)	7					<b>V</b>							
		Left Bank	10	9	8	7	6	5	4	3	2	1	
Score (RB)	7					V							
, ,		Right Bank	10	9	8	7	6	_ <u></u>	4	3	2	1	<u>—</u>
9. Vegetative		More than 90% of the			70-90% of the stream-			50-70% of the stream-			Less than 50% of the		
Protection (sc	ore	streambank surfaces and			-bank surfaces covered			bank surfaces covered			streambank surfaces		
each bank)		immediate riparian zones			by native vegetation, but			by vegetation; disruption			covered by vegetation;		
Note: determine left	or	covered by native			one class of plants is not			obvious; patches of bare			disruption of streambank		
right side by facing		vegetation, including			not well represented			soil or closely cropped			vegetation is very high;		
downstream.		trees, understory shrubs,			disruption evident but not			vegetation common; less			vegetation h	as been	
		or nonwoody			affecting full plant growth			than one-half of the			removed to		
		macrophytes; vegetative			potential to any great			potential plant stubble			5 centimeter	s or less	in
		disruption through			extent; more than one-			height remaining.			average stul	oble heig	ht.
		grazing or mowing			half of the potential plant								
		minimal or not evident;			stubble height remaining.								
		almost all plar	nts allowe	d									
		to grow natura	ally.										
Score (LB)	7			П		$\overline{A}$	П	П	П		П		
		Left Bank	10	9	8	7	<u></u> 6		4	3	2	1	
Score (RB)	7		П	П	П	<b>V</b>	П	П	П		П	П	
		Right Bank	10	9	8	7	6	 5	4	3	2	1	
10. Riparian		Width of ripari	an zone		Width of rip	arian zoi	ne 12-	Width of rip	arian zone	6-	Width of ripa	rian zone	e <6
Vegstative Zone		>18 meters; human			18 meters; human			12 meters; human			meters: little or no riparian		
Width (score each		activities (i.e., parking			activities have impacted			activities have impacted			vegetation due to human		
bank riparian		lots, roadbeds, clear-			zone only minimally.			zone a great deal.			activities.		
zone)		cuts, lawns, or	r crops)										
<b>,</b>		have not impa	. ,	e.									
Score (LB)	7			<u>.</u>		<b>V</b>		<del>'                                    </del>	П	П	$\Box$	П	
230.0 (25)	•	Left Bank	10	<u> </u>	<u> </u>	<u> </u>	<u> </u>		<u> </u>	<u> </u>		<u> </u>	
Score (RB)	8	LCIT DAIIN	$\frac{10}{\Box}$	$\frac{1}{\Box}$	<u> </u>	$\overline{}$	$\overline{\Box}$	$\overline{}$	$\overline{\neg}$				$\Box$
	O	Right Bank	<u> </u>	<u>၂</u>	<u>8</u>	<u> </u>	<u> </u>	<u></u>	<u> </u>	3	<u></u>	<u> </u>	
TOTAL SCORE	99	_	-0	,	- 0	,			<del>-</del>				
IUIAL SUUKE	33												